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EDITORIAL : SOME HIGHLIGHTS

Development Perspectives.

The Tamil Nadu Government has on 25th May 1971 established the State Planning Commission with Hon. Thiru M. Karunanidhi, Chief Minister, as Chairman, Thiru E.P. Royappa as Vice-Chairman, and as members Dr. Malcolm S. Adiseshiah, Director, Madras Institute of Development Studies, Thiru N. Mahalingam, Industrialist, Dr. B. Natarajan, Chairman, Institute for Techno-Economic Studies, Madras, Dr. V. Shanmugasundaram, Professor of Economics, University of Madras and Dr. Bright Singh, Professor of Economics, University of Madurai. Mr. A. Ramdas, Deputy Secretary, Department of Finance is Secretary of the Commission. The Commission will:

(1) 1. "make an assessment of the material, capital and human resources of the State, including Technical personnel, and investigate the possibilities of augmenting such of these resources as are found to be deficient in relation to the State's resources;

2. formulate a long term Plan for the most effective and balanced utilisation of the State's resources;

3. indicate the factors which are tending to retard economic development, and determine the conditions which, in view of the current social and political situation, should be established for the successful execution of the Plan; and

4. make such interim or ancillary recommendations as appear to it to be appropriate either for facilitating the discharge of the duties assigned to it; or on a consideration of the prevailing economic condition, current policies, measures and development programmes; or on an examination of such specific problem as may be referred to it for advice by this Government.

(2) The Planning Commission will be purely an advisory body and it will make its recommendations to the Cabinet. The responsibility for taking and implementing the decisions will rest with the Government.

Perspective Plan.

(3) i. The immediate objective of the State Planning Commission will be to prepare a perspective plan covering the decade 1971-1981. In preparing this plan, the Planning Commission will start by setting desirable and feasible goals for State income and its distribution between different sections of the people. It will also keep in view the declared social goal of achieving a socialist society.

ii. The perspective plan will draw up an estimate of the investments needed in various fields of economic activity to achieve the desired target of rate of growth. These investments will cover the private and the public sectors, the central and the State Governments, the co-operative sector and various financial institutions. The perspective plan will spell out the resources required in terms of manpower, materials and equipment besides finances needed to implement the programmes.

iii. The perspective plan will discuss and place before Government for their consideration alternative strategies for achieving the goal of growth. Such alternative strategies will include for instance, relative importance to be accorded to industry or to agriculture, small industry or to heavy industry. The perspective plan will also indicate in terms of broad orders of magnitudes the phasing of investments and benefits arising from adoption of different strategies.

iv. In preparing the perspective plan, the Planning Commission will utilise the best available talent in the country either by directly engaging experts or on a consultant basis. The Planning Commission will also establish a basis for continued refinement of the perspective plan. Thus, the Planning Commission will initiate studies with a view to drawing up an input output model for the State. This will enable the updating of the perspective plan from time to time.

v. The Planning Commission will set up advisory groups consisting of Government officers both of the State and the Centre as well as of others to assist the Commission in drawing up the Plan.

vi. The responsibility for drawing up the annual and five year plans and discussing them with Government of India will continue to vest in the Finance (Planning) Department of the State.

vii. The review of progress of plan schemes will continue to vest in the State Development Committee of the State Cabinet.

Simultaneously, the Central Planning Commission is being reorganised from a subject centred organ to a functional body dealing with the four major tasks of data collection, plan formulation, supervision of project execution and programme evaluation. Mid-term Fourth Plan reviews are under way with political parties, scientists and economists in order to strengthen plan

activities which will channel increased investments to promote the twin objectives of growth and social justice. These reviews are resulting in changes in inter and intra sectoral priorities as a means of attaining a higher growth rate and the socio political objectives of increased employment, special programmes for the poor, correction of regional discrepancies etc. Advantage should be taken of this reorientation of the Fourth Plan and the complementary functioning of the State Planning Commission to build in two essentials in the country's planning efforts. The first is to decentralise planning to the maximum extent possible so that its processes are rooted in and arise from the Panchayat Taluk and District programmes. The second is to streamline and shorten the procedures of project formulation, approval and execution so that there is a real sense of urgency in execution.

The Economic Survey for 1970-71 presented to Parliament indicates the sombre background against which planning at the State and National level has to be undertaken. The growth rate of 5.5 per cent is really an indicator of stagnation, as it is based on a 5 per cent industrial sector growth, which ought to be double that. In fact the performance of the public sector which accounts for this lag has multiple effects. It acts as a drag on agricultural development, forcing increasing imports. More steel is needed for more farm implements, more cement for more irrigation, more petro-chemicals for more fertilizers and pesticides etc., Further, as the Economic Survey points out the tax burden and direction for the Central budget is another effect of the poor public sector performance. An investment of Rs. 5,000 crores in the undertakings ought to be yielding Rs. 500 crores revenue annually. Instead a loss of Rs. 80 crores is registered for last year. The resultant compensating tax burden continues to suffer from a narrow base, 0.5 per cent of the population contributing 12½ per cent of the national budget compared to 32 per cent of the population in the U.S., 39 per cent in U.K., and 49 per cent in Japan as its equivalent. Or again our tax structure is based on the Rs. 1,70,000 crores of non agricultural income which contributes 5 per cent in taxes while an equivalent amount of agricultural incomes is practically tax exempt, contributing only 0.007 per cent of its total output. Issues of social justice are here raised concerning equal treatment of the rural and urban rich. Such structural tax

distortion is also a disincentive to saving which is another stagnant feature of our economy. The 12 to 15 per cent target is made almost impossible. A heavy tax burden for the country is inescapable with its many sided and completing demands of growth, employment generation, export promotion, ameliorative action for the poor 40 per cent of our people as well as the mounting burdens of defence expenditures and the unplanned tragedy of the cost of East Bengal refugees. In view of the country's narrow fiscal base, the tax direction, that is the heavy reliance on indirect taxes has inevitably an unfortunate consequence, namely inflation. Here the Railway budget also plays a part. The freight rates rises will increase industrial costs particularly those of steel, cement, chemical and engineering industries. The increased costs of coal, ore, steel and cement will soon be reflected in rising industrial prices. Tamil Nadu must thus be ready for a further bout of inflation during the current year. Last year's 6 per cent price rise was bad enough. If there is not to be a similar price inflation this year, immediate action should be taken both to expand production of essential goods and ensure that they are not in short supply. The first impact of the new or increased excise duties in the State has so far been moderate. Only petrol (20 paise) kerosene (4 Paise) gas (80 Paise) registered increases. The other taxed articles, soaps, cosmetics, textiles and ready made garments, two weeks after the budget are selling at the pre budget price. The market opinion is however that price rises will soon occur.

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Industrial Pointers.

The three plantation industries, tea, coffee and rubber have registered heavy out-put expansion and in the case of tea and coffee are meeting increased internal demands and are earning increased foreign exchange. The output of natural rubber for the past year is 90 thousand tonnes, reclaimed rubber 10 thousand tonnes and synthetics 30 thousand tonnes, grossing over 1.30 lakh tonnes. However this increased rubber production coexists with an acute shortage of rubber goods in the State, notably truck tyres at a time when the summer season demand for them is particul-

arly heavy. There is a 35% shortfall in the tyre supply of the State, which is the equivalent of a month's stock. This decline in production hits the export market seriously, which is all the more tragic as the Madras Rubber Factory has won international recognition for its exports. Its export prizes are a recognition of the quality of its Mansfield and other sophisticated tyres which are in heavy demand in the U.S. and other foreign markets. Last year M.R,F. contributed 20 per cent of the total rubber exports of the country. The major reason for the slow down in tyre and other rubber goods production is the lack of industrial peace. M.R.F. has had a prolonged strike, Goodyear has reduced production because of power shortage and labour troubles, and National Rubber and Bata have slowed down production because of industrial disputes. The result is that rubber stocks are accumulating and the market talks of a glut in rubber supply when all rubber goods are in severe short supply. It is against this background that all support should be given to the Government's efforts to develop a new industrial policy which can prevent the repetition of the 19 million mandays lost in 1970 and usher in a year of strike free industrial growth. The first results of the consultations with labour and management have not produced agreement on the major instrument of industrial peace, the Industrial Relations Commissions. With so much of the year's production effort at stake, these consultations must continue till agreement is reached and all of us must help.

Sugar decontrol has been beneficial particularly for Tamil Nadu, whose sugar allocations are large and where adequate traffic arrangements can counter the losses suffered by the mills from the working of levy and free sugar. The excise duty is now a straight 30 per cent ad valorem one based on a weighted average of earlier levies. What is further required for sugar production in the State to benefit is a cane price policy. The present policy has made for varying sugar industry cost structures between different states. There is a case for fixing the cane price on the basis of an 8.5 per cent recovery in order to ensure the free movement of the product between States as well as to meet the legitimate needs of consumers for stable prices and growers for remunerative prices. In this regard the first reaction of the industry outside of the State is discouraging. Bombay reports a

sharp rise in sugar prices (Rs. 6/- per quintal) due primarily to the industry and corporations not using their quotas fully. All the gains of decontrol are in danger of being lost through this price hike and the warnings of Union Minister of Agriculture need to be heeded. There is a case for a careful study into the workings of sugar mills in the country, particularly the real cause for their sickness.

Due to modernising management processes, working to full capacity and constantly improved technology, the Surgical Instruments Plant has for the first time last year stopped working at a loss. Its production has jumped 300 per cent from 1.7 lakhs instruments in 1969-70 to 4.3 lakhs in 1970-71. Its export contribution has shot up from Rs. 14,000 in 1967-68 to Rs. 35 lakhs orders for the current year. The year's production of the five main types of surgical instruments in which it is specialising will be more than Rs. 120 lakhs. There may be a lesson here for other public sector undertakings. The Sodium Hydro-Sulphite Plant to be established at a cost of Rs. 4·5 crores at Karaikudi should follow this path and its realisation speeded up. Another first is the Indian made computer installed at Binny's which will energise its technology, operations research, inventory control and accounting.

So too the Neyveli Thermal Station has increased its power generation and production of domestic fuel. It is now producing 500 M. W. power and will easily pass its target for the export of 1730 million units during 1971-72. Again the speed with which the Kalpakkam Nuclear Power Project is being executed is a refreshing contrast to the Salem Steel Project. Construction of Laboratories by the year end will be completed for the country's first fast breeder test reactor in this project. The reactor will use to the fullest our comparative cost advantage in our abundant thorium supplies, thus providing power at low rates to the rural areas. In this connection the plans for the speedy provision and maintenance of power to rural users by the State Electricity Board is welcome. One bottle neck in rural power supply is the services of trained electricians, wiremen etc. The five fold expansion of the Neyveli training programme to meet this need is timely. The other rural power problem is beaurocracy and over-

centralisation. The decentralising of authority to the District and Taluk offices of the Board will make for speedy action in power supply. Finally the simplification of financial requirements through a single deposit system will also help the rural consumer. The Thiruvallur Industrial Estate is to include a Central Electrical Testing Laboratory for which the State Government will provide Rs. 12 lakhs so that the present eight and future forty electrical goods units in the Estate can be provided with testing, certification and product development facilities. This will improve power supply in both rural and urban areas and provide two thousand additional jobs.

At a time when international trade like aid faces a decline for the third world, Tamil Nadu prospects for expanding its handicraft exports, textiles, carpets, wood and metal works should be speedily and fully exploited. U.S. and EEC Markets offer unlimited entry to our handicrafts. What is needed in the State is organisation—organisation of this fragmented and dispersed industry in order to stimulate and expand the production of goods in demand and service adequately the attractive foreign markets through acceptance of advance orders, stock piling etc. The Southern Regional office of the All India Handicrafts Board and the proposed Tamil Nadu Handicrafts Corporation should undertake the following tasks: All handicrafts producers should be registered as members: links which are today nonexistent should be established between the producers and the market particularly the foreign market: research and developmental activities should be launched for this employment oriented sector. Another new effort is the Nylon Fisheries Net Plant that is to be set up in Madras with an investment of Rs. 7 lakhs by the Tamil Nadu Agro Industries Corporation. This together with the proposed Nylon Factory in Madurai will expand noticeably the employment market for skilled workers.

The Southern Railway record both in passenger and freight services earnings continues to decline. The main reason is the highly competitive road and highway transport services in Tamil Nadu and this is likely to increase in the coming year. In adapting to the situation, the Southern Railway needs a certain autonomy in developing and applying its procedures and in using modern

management and operational practices. In this regard the record of the Thiruchi Railway Workshop which has emerged as an efficient, flexible and technologically advanced public sector unit for the Southern Railway and in fact for all of India is a useful pointer. It produces one thousand wagons annually, constituting 60 per cent of the national output. It is developing several types of wagons, ordinary, special and sophisticated with an important export component. Its technical staff has reoriented quickly its facilities for diesel electric locomotives which it is producing at the rate of two per annum. The Golden Rock Workshop is thus both technically in the forefront in its line of production and is constantly expanding its employee pay roll.

The situation on the steel front continues to demand close attention. By the end of the Fifth Plan, according of the most optimistic output estimates Steel production will not exceed 18 million tonnes. Towards the end of the seventies even if all present plans are executed and all units are working to full capacity, the shortfall in steel supply is likely to be of the order of 5 million tonnes. Hence there is no time to lose both in tuning up production in Bokaro and Hindustan Steel and in the early operation of the new plants in Salem, Visakhapatnam and Hospet. The 1970-71 dismal record in Salem involved an expenditure of a mere Rs. 15 lakhs. The plan estimate for the current year of Rs. 73 lakhs must be expended in completing the building construction. The mineral Survey in the State has so far identified 500 to 600 million tonnes of iron ore deposits in the Salem, North Arcot and Dharmapuri Districts, thus ensuring to the new plant plentiful raw material supply.

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Agricultural Development :

Four districts, Thanjavur, North Arcot, Chingleput and Coimbatore will have about Rs. 60 crores invested in the next two years in helping 50 thousand farmers, instal 70,000 bore wells, 10,000 ordinary wells, 4500 tube wells, 4000 electric

water pumps and 1500 tractors. The State at present needs 3000 tractors and the remaining demand will be met by the five tractor hiring centres in the State. The results will be a near doubling of paddy and other food and cash crops in the four districts by the end of the Fourth Plan period. The success of this important programme which is being financed from Central Government and World Bank loans will depend on meeting three conditions. First there is need for flexible, economical and speedy administration of the various components of the programme by those who will be disbursing the funds, such as the department, the co-operative banks etc. Second there is need for a supporting research and training effort. The research and training programme which is being planned at Coimbatore should support this programme through providing facilities for designing, developing and testing tractors, pumpsets and other farm machinery being installed. Third a concentrated research programme involving developing a Rice Research Institute in the State and a post harvest research service which should be aimed at improving farm practices in harvesting, drying and storage is needed. The Government's plans in this regard at Pattukottai should be developed in light of these considerations.

A further boost to farm production in the State is the rapid progress being made in aerial spraying which now covers over 6 lakh acres. The Agro-Industrial Division with a capital of Rs. 40 lakhs that is being established within the Tamil Nadu Agro Industrial Corporation will be a means of extending and intensifying this activity. It will enable an immediate doubling of aerial spraying of farm lands. Here again multi disciplinary research on the effects of aerial spraying in the districts involved needs to be undertaken as a parallel activity to avoid dangers to human and animal health. Tamil Nadu is a fast moving pioneer in aerial spraying and the results will be watched with interest by the other States.

Water in the State is still the subject of un co-ordinated ad-hoc efforts. The State as well as the country needs urgently a co-ordinated and integrated water policy. The Government's programme for a Rs. 10 crore water supply and drainage scheme for which a loan is being negotiated with L.I.C., the State Water

Supply and Drainage Board's ambitious programme for sinking bore wells in dry and drought stricken areas, the proposed Hydrological Research Institute for research on ground water resources are all necessary, each in its own right. However given the fact that we have arrived at the stage of the exhaustive use of our water resources and face a mounting demand for the future there is need for a comprehensive, co-ordinated and integrated water policy for the country and the State. In two years Unesco's International Hydrological Decade will be terminating and before then its experience and expertise should be used to establish a water policy for the State and the country. In such a national policy, the All India River Grid Project linking the Ganges in the North with Tambraparni in the South should be examined not simply as a major engineering programme which it is, but as part of the grave water problem which will soon be facing the State and the country.

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Education :

The Damodaran Committee Report on Polytechnic Education is an educational land mark. The problem before the country and the State is the quantitative expansion of polytechnic education on the one hand and the unemployment and refusal by industry of employment of graduates from these institutions on the other. The report of the Committee is aimed essentially at the quality training and education of polytechnicians and at the establishment of close and integrated links with industry. The major recommendations are: the raising of the entrance qualification of students, the problem and project oriented approach in curricula, the grounding of industrial training in local industries, the introduction of industrial consultancy and proto type production programmes and for all this to become a reality a graduated programme of autonomy for each polytechnic, so that it can develop in relation to its local industry. There is no time to lose in acting on these recommendations. The All India Council of technical education should review and approve the recommendations with speed, so that they can be executed by the State departments of technical education, the polytechnics and the local industrial establishments. Tamil Nadu must begin by changing

ts entry requirements from S.S.L.C. to a further year of pre technical training or a polytechnic diploma oriented P.U.C.

The Sixtieth State Conference of Education organised by the Tamil Nadu Asiriar Kazhagam at Sri Sarada College Salem in June brought together some 2000 teachers and teacher representatives from the State. The Conference undertook a broad delineation of the system and perspectives of education in Tamil Nadu during the seventies. Particular attention was paid to the quantitative explosion that the State's education faces and the urgent need for reform and regeneration of the education offered in its school and out of school institutions. The conference also provided a much needed forum for the ventilation of the grievances of the urban and rural class room teachers. Most of the grievances did not require more money, so that the lack of financial resources cannot be adduced as reason for inaction. Most of the problems related to mismanagement, unfairness, unjust promotions or transfers, some nepotism and above all a lack of any organised procedure to deal with grievances. This is a serious matter. To have disgruntled teachers providing education is like having sick doctors dispensing medicine. The two major recommendations of the conference were for the setting up of a Board of Education so that the class room teachers and professional educators could be associated with the planning, administration and the urgently needed reform of the State's education. The second was for the setting up of an Ombudsman, a small group of young and independent investigators, who would be directly attached to the Minister of Education to deal solely and systematically with teachers' problems and grievances.

The Madras Section of the Andhra Mahila Sabha celebrated in June its 35th anniversary with the participation of the new Governor, His Excellency K. K. Shah whose spontaneous and forth-right identification with the State problems is setting a new style, and the whole hearted support of the work of the Sabha by the Chief Ministers of Tamil Nadu and Andhra Pradesh. The Sabha which owes its origin and increasing educational, medical and social work for the poor section of Tamil Nadu, to the dynamism and vision of Mrs. Durgabai Deshmukh will be developing further its medical and orthopaedic work in the coming year. The Sabha

has been requested by the government to undertake a State wide enquiry in Tamil Nadu on the reaction of the people in the town and village with regard to the use of conventional contraceptives. This is the second State wide study being initiated within two months, the other being the one on food habits reported in the last issue of the Bulletin. The two enquiries though undertaken by separate agencies should be conducted so as to reinforce each other's conclusions. The results of this study will help the State and Central Governments and the health authorities to decide on what future action and reorientation in the family planning programme will be needed in order to make it more effective with Tamilians.

Tamil Nadu has one of the most important collections of oriental manuscripts in the country. This collection lodged in the Madras University Library premises has an impressive Tamil Section and small sections in Malayalam, Telugu, Urdu, Persian and Thai. This Government oriental manuscript library with its collection of 62,000 manuscripts and 19,000 published books and its curator Mr. R.N. Sampath provide rich reference materials for research scholars in Deccan cultures both at a national and economical level. It should be given intellectual support by IFLA and the specialised bodies of oriental scholars.

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Workshop on Economic Research Methodology closes:

The six week workshop on Economic Research Methodology attended by 35 Economics Ph.D. students and staff supervisors from the 10 Universities in Andhra Pradesh, Kerala, Mysore and Tamil Nadu closed on June 12 at the Post Graduate Pavilion, Madras Christian College Tambaram. The workshop defined the methodologies appropriate for economics research in the South. The various steps leading to the selection of the research theme, the bibliographical problems, the formulation of hypothesis and the testing of its consistency either logically or through pragmatic data assembled by the census, N.S S. or case study or both were emphasized. It was noted that there is not enough training in the research tools of statistics, mathematics and econometrics in

current university courses. It was also noted that most of the research was related to the agricultural development of the four states, with fiscal economics, industrial economics and planning also commanding attention. In the present poverty situation of the country, a sharp distinction cannot be maintained between fundamental research and the problem oriented or applied one. What is essential is that both elements should be present in all research. The workshop examined the research design of each participant and made suggestions for its modification, elaboration, improvement or clarification.

It expressed its particular thanks for the valuable guidance received from the resource staff: Dr. C.T. Kurien, Professor of Economics, Madras Christian College who acted as Director, Prof. N.S. Iyengar, Osmania University, Prof. K.S. Sonachalam, Member, Railway Rates Board, Prof. S. Krishnamurthy, Institute of Economic Growth, Delhi, Prof. O.R. Krishnaswamy, College of Rural Higher Education, Coimbatore, Prof. S.K. Bhattacharyya, Calcutta University, Mr. S.P. Ahuja, Indian Institute of Public Opinion, New Delhi, and Prof. M. Shanmugasundaram, University of Madras.

The Workshop also considered some of the weaknesses in its functioning which were mostly due to the speed with which it was organised (less than two months). The need for a more regular programming of resource staff, further sessions on statistics and mathematical methods, more adequate use of staff supervisors and further planning of individual assignments including practicals and library work, which on this occasion did not function effectively, were emphasized. The administrative arrangements for the Workshop could be made more uniform with other such programmes of the I.C.S.S.R. Future sites should also be chosen from the point of view of climate. (The first week registered a temperature of 42-44°).

The workshop reaffirmed the value of this unique method of participants deciding the programme of work at all stages, thus promoting both intellectual self reliance, growth and self discovery. One product of the workshop will be a Handbook of Economics Research Methodology which could be a useful pre Ph. D. guide for the Southern Universities.

The workshop decided to recommend to the Madras Institute of Development Studies, the Indian Council of Social Science Research and the Ten South Indian Universities that the next Workshop in Economic Research Methodology in the summer of 1972 should be held at the Karnatak University, Dharwar. At its closing function the Madras Institute of Development Studies presented certificates of attendance and work to the participants of the workshop.

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September Seminar on Consumer/User Oriented Research :

Preparations for the Seminar announced in the last issue of the Bulletin are proceeding satisfactorily. The Seminar will be held on September 17, 18, and 19 in Room No. F 50, University Buildings, Madras University. The four groups of participants namely those from the private sector, those from the public sector, Secretaries of Tamil Nadu Government dealing with development problems and those from the three Universities and their affiliated colleges and the two Research Institutions in the State have agreed to participate in the Seminar and are undertaking the necessary preparations. The end product of the Seminar will be a three year Research programme in Tamil Nadu Development, representing the last three years of the Fourth Plan, to be shared out among the Universities and research institutions in the State.

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Contents of the Special Issue :

The Bulletin will have two special issues every year. These will be its sixth issue, which this year is the July issue and normally its twelfth issue which this year will be published in December as the eleventh issue. The numerical variation of the issues in 1971 is due to the fact that the Institute started at the end of January 1971 and will therefore publish eleven instead of twelve issues this year.

This special issue contains the usual editorial and two articles: the June Seminar paper on the Economics of Dry Farming Technology in Tamil Nadu by Mrs. S. Jayalakshmi Ganesan, Research Assistant, Madras Institute of Development Studies; the Second Article is on Social Justice in Economic Development. The special section of the Issue reports on the first census of social science research completed or nearing completion in Tamil Nadu Universities and Research Institutions. As a first survey of this important area it lacks both completeness and uniformity, which will be corrected in the sixth issue of the 1972 Bulletin. This special section also contains an article on Research Methodology in Economics in South Indian Universities, by Dr. C. T. Kurien, Professor of Economics, Madras Christian College, Tambaram.

ECONOMICS OF DRY FARMING TECHNOLOGY IN TAMIL NADU

By

MRS. JAYALAKSHMI GANESAN, *Research Assistant*
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Importance of Dry Farming :

Agriculture in areas with inadequate and uncertain rainfalls is of special importance. For the total agricultural development of the country, urgent attention needs to be focussed on unirrigated farming as only 20% of the cultivated land is under irrigation and 80% is farmed under rainfed conditions. If a major dent on poverty and unemployment is to be made, the agriculture in the low rainfall areas requires immediate attention. The application of what is called dry farming technique in such low rainfed areas needs study.

An immediate enhancement in the productivity of rainfed areas is not merely a social necessity but is also vital for turning the industrial regeneration and upsurge now on the horizon into a reality and for avoiding an undue control by weather over our agricultural fortunes, 97% of the groundnut crop is raised in unirrigated areas and consequently the produc tion of groundnut oscillates with the weather. There is a further problem faced by the dry farmers. Most of the oil seeds as well as the pulse crops are cultivated predominantly in the dry areas. When dry land comes under irrigation, the pulse crops are replaced by paddy and other wet crops. There has thus been a steady decline in the per capita availability of pulses during the last 10 years. This decline increases the incidence of protein mal-nutrition. The significance of the development of a new technology for dry land farming for eliminating agrarian poverty and unemployment, for stabilising food production, for reducing malnutrition and for sustaining and accelerating industrial advance cannot be over-emphasised.

Dry Farming Regions in Tamil Nadu :

Among the districts of Tamil Nadu, Dharmapuri, Tiruchi, Salem, Tirunelveli, Coimbatore, Madurai, Kanyakumari and Ramnad are the most dry areas whereas South Arcot, North Arcot, Chingleput and Thanjavur districts have better irrigational facilities. This can be shown from the following table where the percentage of net area irrigated to the net areas sown is listed by districts.

TABLE—I

Percentage of net area irrigated to the net area sown in the different districts of Tamil Nadu in 1960-61 and 1966-67 :

District.	% of irrigated area to the net area sown *1960—61*	*1966—67*
South Arcot	49.9	48.3
Ramnad	44.6	36.4
North Arcot	38.6	36.4
Coimbatore	36.6	31.8
Madurai	35.5	33.8
Kanyakumari	34.5	39.4
Tirunelveli	31.6	34.1
Tiruchirapalli	27.7	29.4
Salem	17.3	28.7
The Nilgiris	1.5	2.2
Dharmapuri	—	14.3

Source : Season and Crop Reports 1960-61 and 1966-67.

The Common dry crops of Tamil Nadu :

The common dry crops of Tamil Nadu include millets like cholam, cumbu, ragi, maize, pulses like redgram and Bengal gram, oilseeds like groundnut, gingelly and castor and cotton. The table below gives the cropping pattern of Tamil Nadu.

TABLE—II

Table showing the cropping pattern of Tamil Nadu.
(in 1000 hectares i.e. '000' being omitted).

	Crops.	1965—66		1966—67		1967—68	
1.	Rice	2502	(35.4)	2689	(37.4)	2660	(36.4)
2.	Cholam	759	(10.7)	743	(10.2)	705	(9.6)
3.	Cumbu	400	(5.6)	415	(5.7)	430	(5.9)
4.	Ragi	329	(4.7)	313	(4.3)	312	(4.3)
5.	Other cereals and millets	478	(6.8)	489	(6.4)	452	(6.2)
6.	Pulses	398	(5.6)	434	(5.9)	448	(6.1)
7.	Other food crops	450	(6.4)	445	(6.2)	486	(6.7)
8.	Total food crops	5316	(75.2)	5528	(75.7)	5493	(75.2)
9.	Cotton	321	(4.5)	313	(4.3)	294	(4.0)
10.	Groundnut	955	(13.5)	994	(13.6)	1066	(14.6)
11.	Gingelly	118	(1.7)	138	(1.9)	115	(1.6)
12.	Coconut	59	(1.0)	68	(0.9)	71	(1.0)
13.	Other non food crops	287	(4.1)	264	(3.6)	270	(3.6)
14.	Total non food crops	1750	(24.8)	1177	(24.3)	1816	(24.8)
15.	Gross area sown	7066	(100.0)	7305	(100.0)	7309	(100.0)

Source: Basic Agricultural Statistics, Tamil Nadu, 1970, Issued by the Director of Statistics, Madras-6.

The figures in brackets indicate percentage of gross area sown under each crop.

The above table indicates that among the dry food crops cholam and cumbu, among the non food crops cotton, and among the oil seeds groundnut are grown in large areas.

The area, total production and average yield per hectare of principal crops in Tamil Nadu have varied from year to year and this is shown in the following table :-

Table showing variations in area, total production and average yield per hectare of principal crops in Tamil Nadu.

TABLE—III

Year	Area (1000 hectares)	Production (1000 tons)	Yield per hectare (in Kg.)
Cholam			
1960—61	774	631	816
1965—66	759	513	675
1969—70	732	575	786
Cumbu			
1960—61	489	301	616
1965—66	400	235	588
1969—70	459	310	675
Ragi			
1960—61	364	360	989
1965—66	329	292	889
1969—70	336	337	1002
Maize			
1960—61	7	7	1098
1965—66	4	4	1072
1969—70	13	14	1081
Cotton			
1960—61	396	374	167
1965—66	321	301	169
1969—70	345	397	207
Groundnut			
1960—61	871	1057	1217
1965—66	955	823	866
1969—70	982	910	927

Source: Basic Agricultural Statistics Department of Statistics, Tamil Nadu 1970.

Table III indicates that Cumbu, Cholam, Ragi, Cotton and Groundnut are the most important dry crops of Tamil Nadu.

Selection and applicability of the various dry farming measures which go to conserve moisture in the soil depend on rainfall, disposal of rainfall, soil type and climatic conditions of the Region. In Tamil Nadu the following districts would come under the dry farming regions on the basis of their rainfall.

Coimbatore, Tirunelveli, Ramanathapuram, Madurai, Salem, Dharmapuri North Arcot, Tiruchi, Thanjavur, South Arcot, Madras, Chingleput, and Kanyakumari.

In the hilly regions of the Nilgiris District, Shevaroys in Salem District and Kodaikanal in Madurai District which receive a total rainfall of more than 45" per annum on an average and where the number of rainy days is distributed almost throughout the South-West and North-East Monsoon periods, the main problem is disposal of excess water. In addition there is the problem of conservation of optimum moisture in the soil. These tracts are therefore not included under dry farming region.

TABLE—IV

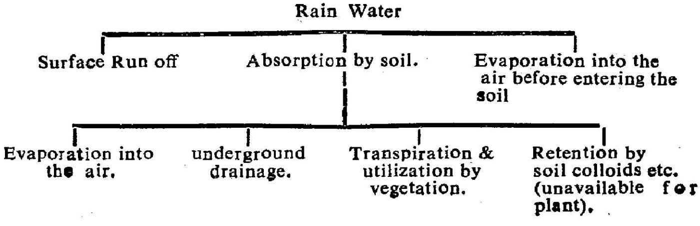
Districts by range of normal rainfall. Range of rainfall :

in mm.	*Districts.*
Below 800	Coimbatore.
800 — 1000	Tirunelveli, Ramnad, Madurai, Salem, Dharmapuri, North Arcot and Tiruchi.
1000 — 1200	Thanjavur and South Arcot.
1200 — 1400	Madras and Chingleput.
1400 — 1800	Kanyakumari.
1800 and above	The Nilgiris.

Source : Basic Agricultural Statistics, Tamil Nadu, 1970.

In the examination of the problem of crop failures in the low rainfall areas, investigations into the ultimate conservation of rain water naturally forms an important issue.

The following chart shows at a glance the different ways in which rain water is disposed of.



Certain features of Dry Farming :

1. The Type of soil is very important in the case of dry land farming. Four types of soils, namely alluvial, red, black and laterite soils are normally found in this State. Of these red and black soils are more suitable for dry farming. Laterite soils are found in heavy rainfall regions and alluvial soils are mostly under wet land farming or garden land cultivation. Hence these two types of soils are not generally recommended for dry farming.

2. Rainfall is the major climatic factor on which the cropping pattern of the dry farming areas depends. If there is much rain during the tasselling period, there is considerable shedding of pollen. In a crop like bajra, if there is much rain during flowering, diseases like ergot becomes common.

3. In the dry areas, if the use of fertilizer is excessive, the available moisture in the root zone may get exhausted before the plants come to the reproductive stage thus resulting in poor yields. On the other hand, if the fertilizer application is below the optimum, this would also result in poor yields since there is an input-output relationship between the supply of nutrients and yield. In both cases, the efficiency of water-use for grain production would be very low. This could be avoided by assessing the yield potentialities of different regions and by regulating the soil fertility levels by adding only such quantities of fertilizers as is required for realising the potential.

4. In view of water shortage in dry areas, some suggestions have been made to adjust cropping with salinity and alkalinity problems.[1]

These include: (1) Sowing of seeds in deep furrows and adoption of ridge furrow systems of cultivation. (2) Use of salt and alkali tolerant crops and crop varieties. (3) Use of acid-forming fertilizers and those containing gypsum such as ammonium sulphate, super phosphate and nitro-phosphates in preference to other forms and (4) Use of pelleted bacterial cultures for leguminous crops. In the relatively higher rainfall areas or where

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1. A New Technology for Dry Land Farming by Indian Agricultural Research Institute, New Delhi.

there is good ground water land reclamation can be done by the use of gypsum and impounding of the rain water during the monsoon season.

Cost returns of dry crops of Tamil Nadu :

The chief dry crops of Tamil Nadu are cholam, cumbu, ragi, varagu, samai, thinai, groundnut and cotton. From the point of view of area and importance, the millets rank only next to paddy but unlike paddy, the millets, with the exception of ragi, are very highly localised in their habits. We can take each one of the crops separately and study them by relating each crop to some of the economic quantities such as the time required, seeds, manure and crop rotation or mixture and other characteristics. We could also relate the various measures of improved dry farming to their costs and returns.

For each of the dry crops, the duration, season of sowing, seeds rate, manuring, crop rotation, crop mixture, average cost of cultivation per acre, average returns are shown precisely as follows :

Cholam

Strains — CO. 19, CO. 20, K. 3, Swarna, CSH. 2.

Seasons — June—July to September - October.

Duration — CO. 19, CO. 20, K.3 = 125 to 135 days.
Swarna, CSH2 = 90 to 100 days.

Seed Rate :

(i) Line sowing — Hybrids - 6 Kgs. per acre
other strains - 8 Kg. per acre.

(ii) Broadcast — Hybrids - 8 Kgs. per acre.
other strains - 10 Kgs. per acre.

Sowing : Use gorru or seed drill for line sowing to cover large areas in time and before soil moisture is lost.

Mixed crops :

(i) Line sowing - Four rows of cholam and one line in Lab-lab.

(ii) Broadcast - One line of lab-lab for every 8 feet.

Seed treatment - Treat with Agrosan, Captan or T. M. T. D. at 2 Gms. per Kg. of seed.

Main field preparation :	2 or 3 ploughings with country plough or light iron plough.
Manuring:	Farm yard manure or
Basal	Compost - 5 tons per acre.
	N - 18 Kgs. per acre.
	P - 9 Kgs. per acre.
Spacing	46 cm × 15 cm.
Weeding	- Use Hand hoe, dantula or Hand rotary cultivator First on the 15th day and second on the 40th day after sowing. This also helps to conserve moisture.
Thinning	- Hand thinning immediately after first weeding. However before 20th day after sowing.
Plant protection	- Endrin 150 ml. and Metasystox 100 ml. in 200 litres of water per acre, if there is shoot fly incidence. 2 such spraying for shoot - fly incidence.
Foliar spray	- Zinob at 2 gm/litre
against leaf spot disease:	1. 40 days after sowing.
	2. 15 days after 1st spray.
	3. 15 days after 2nd spray (if necessary)

Cost returns :

Cholam is largely cultivated in the districts of South Arcot, Madurai Tiruchi, and Salem in Tamil Nadu. The cost of cultivation per acre also differs widely from district to district in accordance with the soil conditions and other dry farming practices. For example. the cost of cultivation per acre works out to be Rs. 77-50 in South Arcot district, Rs. 131.85 in Madurai District, Rs. 248-50 in Tiruchi District and Rs. 180-75 in Salem District in the year 1966-67.[3] So the average cost of cultivation works out to Rs. 159.65 or Rs. 160. The acreage under cultivation for cholam was 18, 35, 573 in 1966-67, and the total cost of production works out to Rs. 29, 36, 91, 680 for 1966-67. The average net returns of the cultivators is above Rs. 155 per acre for 1966-67. In this manner it is possible to calculate the average cost of cultivation and average net returns of the cultivators for each of the major dry crops in Tamil Nadu.

3. Cost of Cultivation Report—Fasli 1376 (1966-67).

Bunding of dry fields for conserving moisture did not result in any improvement of the yield of cholam at Koilpatti presumably because of abundant rains during the growing season. Cholam normally responds to manuring and irrigation and a yield of 2500 lb. to 3000 lb. is then obtained as against unirrigated yields of 400 lb. to 1000 lb. of grain. The yield varies from 600 lb. to 2000 lb. of straw under dry conditions to 64,000 lb. of green fodder under irrigation.

The ability to grow two or more crops in a year is the greatest asset of tropical and sub-tropical agriculture. Most improved varieties of cholam are late and are grown as single crops during kharif or rabi. The availability of relatively early and photo-incensitive hybrids and varieties like CSH-1 and Swarna enable practice of several multiple cropping patterns, The growing of early hybrids in kharif could be followed by a winter crop.

In regions like South Arcot, North Arcot, Salem and Tiruchirapalli Districts, mixed cropping of groundnut and castor; groundnut and cotton; groundnut and ragi, groundnut and cholam and groundnut and redgram is being adopted very widely. The crops like castor, red gram and pulses are grown in one or more rows after a wide strip of groundnut. These rows of castor, redgram or cholam when laid across the slope, will provide a vegetative barrier to the flowing run-off and control soil erosion in addition to reducing the velocity of flow of run off. As a result, run off stays on the land for a longer time and the water soaks into the soil to be made available for crop growth.

The experiments conducted at the Dry Farming Sub-Centre at Bijapur have shown that a crop rotation of cotton.—Sorghum (cholam) have increased the yield of cholam grain by 15% and that of straw by 20%. But the observations in Tamil Nadu have shown that cotton—cholam rotation affect the yield of cotton, following cholam in the next rotation due to what is called "Cholam effect" on cotton. Cotton—cholam rotation is therefore not recommended for this State.

The practice of mixed cropping also enables effective feeding of plant nutrients and soil moisture in different levels of soil

layers. In the case of mixed cropping leguminous crops are grown across the slope alternated by strips of other crops and is an effective dry farming measure for conservation of soil and moisture.

Cumbu

Strains :	CO. 4, X. 3, HB. 3.
Season :	July to September - October.
Duration :	85 to 90 days.
Seed Rate :	(i) Line sowing - 3 Kgs per acre. (ii) Broadcast ,, ,,
Sowing :	Use Gorru or seed drill for line sowing to cover large areas in time and before soil moisture is lost.
Seed Treatment :	Treat seeds with Agrosan, Captan or T.M.T.D at 2 gms. per Kg. of seed.
Main field preparation :	Two or 3 ploughings with country plough or light iron plough.
Manuring Basal :	F.Y.M. Compost, Tank Silt - 5 tons per acre. N - 18 Kgs. per acre. P - 9 Kgs. per acre.
Spacing :	(i) Line sowing - 45 cm × 15 cm. (ii) Broadcast - 15 cm between plants.
Weeding :	Work country plough on 20-25th day after sowing " Payirulavu "

F.Y.M. Farm yard manure.

Thinning :	Hand thinning for line sown crop before 20th day and after " Payirulavu "
Plant protection :	Dust sevin and sulphur 1 : 1 at 6-8 Kgs. per acre at the time of flowering to protect from midge fly and calocoris.
Spray against sugary disease (if prevalent) :	Spray Ziram, Zinob or Wettable sulphur at 2 gm/ litre of water. 1. First spray at flower opening. 2. 2nd spray 5 days after 1st spray. 3. 3rd spray 5 days after 2nd spray.

Cost returns:

The average cost of cultivation per acre for cumbu in Tamil Nadu was approximately Rs. 130/- for the year 1966-67. The total area under cultivation was 10, 24, 240 acres in 1966-67 and the total cost of production of all the acres works out to be Rs. 13. 31, 51. 179. The average net returns of the dry farmers is Rs. 132/- per acre.

Ragi.

Strains : K. 2, CO. 2, Co. 5.

Season : June - July to September, October.

Duration : 120 - 130 days.

Seed Rate :

1. Line sowing. 3 Kgs. per acre.
2. Broadcast. -do-

Sowing : Use Gorru or seed drill for line sowing to cover large areas in time and before soil moisture is lost.

Mixed crops : Lab-lab, green gram and black gram may be sown in the following ratio.

(i) Line sowing - 16 rows of ragi and one row of pulses.

(ii) Broadcast - One line of pulses for every eight feet.

Seed Treatment : Treat with Agrosan, Captan or T.M.T.D. at 2 gms per Kg. of seed.

Main field preparation : 2 or 3 ploughings with country plough or light iron plough.

Manuring : F. Y. M. or compost - 5 tons per acre.

Basal : N - 18 Kgs. ,,

P - 9 Kgs. ,,

Spacing : (i) Line Sowing 15 cm × 15 cm.

(ii) Broadcast 15 cm between plants.

Weeding : Use hand hoe, dantulu or hand rotary cultivator. First on the 5th day and second on the 40th day after sowing. This also helps to conserve moisture.

Thinning : Hand thinning immediately after first weeding however before 20th day after sowing.

Plant Protection : Dust ceresan line mixture at the time of flowering at 6-8 Kgs. per acre to protect from blast.

Cost Return :

The average cost of cultivation per acre of Ragi in Tamil Nadu was nearly Rs. 150/- for the year 1966-67. The total acreage under cultivation was 7, 74, 222 in the same year and hence the total cost of production came to Rs. 11, 59, 24, 185/- approximately. The average net returns of the cultivators is nearly Rs. 217/-.

Cotton

Soil : Black cotton soil areas.

Strains : K. 7, MCU. 6.

Season : First fortnight of October.

Duration : K. 7 - 195 days.
MCU. 6 Kgs. per acre.

Seed Rate : K. 7 - 6 Kgs. per acre.

Seed Treatment :
(i) Treat the cotton seeds with T.M.T.D. or Captan at 2 gms. per Kg. of seeds.
(ii) Then rub the treated seeds with cowdung paste and red earth (1:3 by volume) and dry in shade.

Sowing : Sow in lines by gorru or seed drill.

For mixed crop : Sow CO. 1 blackgram as a mixture with K. 7. Cotton in the ratio of 3 rows of K. 7 cotton to one row of black gram (CO. 1.).

Preparation of the mainfield : Plough twice with country plough. Use guntaka for breaking clods and levelling.

Manuring the Main field (Basal) : Apply 5 tons of F.Y.M. 16 Kg.
N as ammonium sulphate and 8 Kg. P 205 per acre.
For incorporating these, use Junior hoe.

Spacing : K. 7 - 45 cm × 15 cm.
MCU. 6 - 45 cm × 25 cm.
For both varieties one plant per hill.

Thinning : On 21st day thin excess plants leaving the plant per hill.

Weeding : First weeding on 21st day along with thinning. Second weeding on 40-42 days after sowing.

Other agronomic practices : Work dantulu weeder (danthi) at fortnightly intervals after thinning and before commencement of flowering to minimise cracking of soil and to conserve soil moisture.

Plant protection : Dust carbaryl and sulphur (2 : 1 by weight) at 10 Kgs. per acre a month after sowing.
Repeat five times at fortnightly intervals.

Harvest :
(i) Pick clean kapas.
(ii) Dry the harvested product in shade.
(iii) Remove stained and insect damaged kapas.
(iv) Grade to get better price.

Post harvest operations: After cotton harvest is over pull out the plants promptly. Plough the field with country plough once a month to prevent cracking of soil.

Cost return :

Cotton after bajra gives high yields. When cotton follows cholam, the yield of cotton is reduced by 19%. This ill-effect (Cholam-effect) can be corrected by growing indigo along with cholam or by applying 150 Kg. super phosphate per hectare to cotton following cholam. Cultivators should know the previous crop and raise cotton accordingly.

The average cost of cultivation per acre for cotton was Rs. 229 in 1966-67. The total acreage under cultivation of cotton was 7,73, 416 and the total cost of cultivation came to Rs. 17, 69, 03, 706. The average net returns of the farmers worked out to Rs. 145 in 1966-67.

Ground Nut

Strain : POL. 1.

Duration : 105 days.

Season : March – April to July – August.
July – August to November, December.

Soil : Light soils like sandy, loam, red or black sandy loam.

Preparatory cultivation– 4 - 6 times with iron plough.

Manures & Manuring	- Apply F.Y.M. or compost 6 tonnes and 11 Kgs. P 205 + 33 Kg. K 20 per hectare as basal dressing. After a fortnight apply 10 Kg. borax and 200 Kg. of gypsum per hectare as basal dressing.
Seeds and sowing :	Spacing 6" × 6"
Seed Rate :	140 - 150 Kg. per hectare.
Seed dressing :	Dress the seed kernels before sowing with T.M.T.D or Capton. 2.5 gm. per Kg. of kernel.
Inoculation :	Broadcast bacterial culture mixed with sand. 7 bottles per hectare before or after sowing.
Intercultivation :	First hoeing and weeding between the 20th and 25th day after sowing. Second hoeing and weeding from the 35 th to 45th day after sowing. Remove prominent weeds subsequently from 70th to 90th day.
Plant protection :	1. Application of Endrin spraying Taxaphene + D. D. T + Dimethoate (750 - 1000 ml/ acre. Application of carbophenothion 0-06%
Harvest :	Harvest when black colour is seen inside the sheel and testa becomes rose.

Cost Return

The average cost of cultivation of groundnut came to Rs. 421 for Tamil Nadu in 1966-67. The total area under cultivation was 24,54,790 and the total cost of production was Rs. 103,44,73,093/ The average net returns of the cultivators was Rs. 255/-.

Credit needs of the dry farmers :

Availability of credit to the farmers is an important factor for the cultivation of dry crops. But the dry farmers, access to credit for purchasing the necessary inputs is limited because they cannot offer proper security. Hence I suggest that loans should be given on the basis of increased production potential of the technological package rather than on the security of land. This will enable both small and large farmers to obtain credit.

There has been no organised financing of dry farming till now. Our Nationalised Banks ask for patta (ownership bill) and in the case of dry lands loans are refused to the dry farmers as

the cultivation entirely depends upon rainfall in such areas. Recently the Tamil Nadu government has come forward to help the dry farmers. The State Government through the Department of Agriculture has now started a system of loans and grants for purchasing seeds, fertilizers, pesticides etc; credit is also being made available to land development programmes like soil conservation; land levelling, land shaping tractor ploughing and for purchasing tanks. Credit is being given to train the farmers, to undertake demonstration plots, to purchase implements, machinery and plant protection equipments. Loans are refused to the dry farmers as the cultivation entirely depends upon rainfall in such areas.

On the basis of the preceding analysis an approximate estimate of the credit needs of the dry farmers can be obtained. If we assume that the cost of cultivation per acre for any crop is about Rs. 100 the dry farmer can provide 25% of this amount. Hence in order to promote dry land cultivation, and the technology now evolving farmers must be given liberal credit facilities and I would suggest that at least 75% of the total cost of cultivation should be borne by the Government. In the case of Cholam the average cost of cultivation for 1966-67 came to Rs. 160 and so to cultivate the land the dry farmer should get at least Rs. 120/- per acre by way of loans and grants. In the case of Cumbu he should be given at least Rs. 98/- per acre; in the case of Ragi Rs. 113/- in the case of cotton Rs. 171/- and in the case of groundnut Rs. 315/-.

Marketing difficulties of the dry farmers :

Unlike the commercial crops where the bulk of the produce is intended for marketing, millets have a great local demand. The quantities retained by the producers for their domestic consumption, for payment towards wages and seeds, and the quantities that may be available for marketing vary from producer to producer and from tract to tract depending upon various factors like the extent of area cultivated, method of raising, nature of the crop or crops raised, food habits of the farmers etc. In the case of the small holdings almost the entire produce is retained on the farm itself. Only in the case of big holdings surpluses are available for marketing.

The surplus available for marketing is disposed of in the villages and in the nearby centres. In cases where there are sizable quantities for sale, these are disposed of in the nearby assembling centres.

TABLE — IV

Percentage of the total quantities handled by the agencies in the different districts in 1960-61.

Name of the agencies moving the produce to the whole assembling markets.	*North Arcot*	*Tiruchi*	*Chingleput*
1. Producers	10%	15%	20%
2. Landlords.	25%	20%	10%
3. Village merchants	60%	40%	20%
4. Whole-sale merchants commission agents and brokers.	5%	25%	50%
5. Co-operative organisation	—	—	—
6. Others.	—	—	—

Source: Report on the Marketing of millets in Madras State in 1960-61.

According to the State Marketing Officer, there is no difficulty so far in marketing the produce of the dry farmers since dry farming has not been undertaken on a large scale.

Co-operatives have handled only a negligible amount of the total produce.

TABLE — V

Value of agricultural produce marketed by co-operatives in 1967-70.

Name of the commodity	Amount in (lakh of Rs.)
1. Food grains.	780.05
2. Cotton	185.11
3. Oil seeds	229.78
4. Others	256.69
5. Sugarcane	995.47
	2447.10

Source: Particulars obtained from the Registrar of Co-operative Societies.

Through the Regulated markets also some of the dry crops such as cotton and groundnut are being marketed. There is a Regulated Market Committee for each district.

TABLE—VI

South Arcot Market Committee. (in tonnes)

Year	Groundnut	Cotton
1960	66,330	101.4
1964-65	69,491	401·0
1967-68	85,881	751·3
1968-69	87,242	783·1
1969-70	51,416	636·4

North Arcot Market Committee

1960	1,931	(kernels) (in tonnes)
1964-65	18,977	
1967-68	34,369	
1968-69	39,806	
1969-70	20,206	

Tiruchi Market Committee. (in tonnes)

1960	3,345·6
1964-65	6,400·0
1967-68	8,014·9
1968-69	8,142·5
1969-70	2,111·8

Tirunelveli Market Committee. (in tonnes)

Year	*Cotton*	*Groundnut*	*Blackgram.*
1960	—	—	—
1964-65	27·018	—	—
1967-68	179·651	31·995	—
1968-69	801·656	27·423	1·869
1969-70	245·379	44.160	7·764

Thanjavur Market Committee: (in tonnes)

1960	—
1964-65	4·220
1967-68	4860·803
1968-69	5908·177
1969-70	3833·409

Ramnad Market Committee.

1960	—	—
1964-65	0·700	131·176
1967-68	—	144·900
1968-69	5·800	51·600
1969-70	7·900	132·900

Coimbatore Market Committee.

1964-65	42·500	22·200
1967-68	45·197	59·156
1968-69	116·272	182·273
1969-70	80·555	419·084

Source: Report on the Agricultural Marketing of Madras State.

Most of the dry crops are not being marketed through the Regulated Market or through Co-operatives since most of these dry crops were not grown on a large scale till now: The marketed surplus of most of the dry crops are negligible. Only Cotton and Groundnut are exported to other States. The important centres of movement are Koilpatti, Salem, Villupuram. Panruti, Shenkottai, Pollachi Udumalpet and Hosur (Taluk). As dry farming technology spreads and to help it to spread, there is need to develop regulated markets in every Taluk.

Finally improved dry farming measures as applicable to the soil conditions that obtain in Tamil Nadu should be noted. These measures can be broadly classified into 6 categories namely (1) Preparatory cultivation, (2) Manuring, (3) Seeds and sowing. (4) After cultivation practices, (5) following and (6) Mechanical dry farming measures.

1. Preparatory cultivation:

Under preparatory cultivation, the farmers adopt the various practices of deep tillage, surface tillage, shallow ploughing and harrowing.

The main objective of deep tillage is to open the land for absorption of maximum possible rain water whenever showers are received and allow it to soak deep into the layers of soil in order to conserve as much soil moisture as possible. Deep tillage is adopted to kill weeds and also to expose the layer to sun in order to induce the biological activity in the surface soil for better crop growth. It should be done across the slope and is normally recommended on both red and black soils. It should be resorted to once in 2 or 3 years only, so that the weeds may be periodically eradicated and the soil moisture conserved in deeper layers may enhance the crop growth.

The dry farming experiments at Hagari have shown that deep ploughing every alternate year has given an increase in yield of 15% of grain over that under continuous harrowing. The increase in yield of straw was found to be 14% over harrowing continuously.

The farmers give one or two ploughing with country plough between June and September where a few good showers are received during the South-West monsoon. Greater number of such ploughings after every good shower will keep the land free from weeds and help saving soil moisture.

In some parts repeated shallow ploughing is followed by compacting soils with wooden implement until sowing is taken up. The thorough stirring and compacting the surface soil helps in conserving more moisture in lower layer.

In some parts where cotton and cereals or cholam and pulses are grown in rotation, ploughing is done only for first crop and not for the subsequent crops. This practice amounts to minimum tillage, and maximum conservation of moisture.

During monsoonic months, repeated surface tillage with Guntaka or harrow, stirs the soil; breaks clods, if any; removes weeds; forms a 3" thick mulch of loose soil layer at the surface and thus facilitate better absorption of rain water and conservation of moisture in the lower layer.

In shallow soils, four harrowings, first after 3 weeks after sowing and the rest every month after good showers, are recommended. For deep soils which have a greater soil moisture reservoir, two harrowings will be enough.

2. **Manuring :**

Dry lands were traditionally neglected. Either no protective measures were adopted on such land or the measures adopted were inadequate and ineffective to protect them against erosion and water loss. The practice of applying cattle manure and sheep and cattle penning is in vogue only in very restricted patches of dry lands which are very near the villages. Such application of organic manure is being adopted once in 3 or 4 years depending upon its availability. Application of chemical fertilizers on dry lands had been almost unknown to the farmers.

Under the above circumstances, cropping on dry lands had been impoverishing the soil on a recurring basis and making dry land agriculture an uneconomic proposition. In order to make

the dry land agriculture successful and profitable, it is necessary to adopt the practice of applying organic manures and inorganic fertilizers so that what has been removed from the soil and utilised by the plants grown may be replenished.

Application of organic manure :

(a) **Farm yard manure :** Experiments conducted at the Dry Farming Research Stations at Hagari, Sholapur etc. have shown that application of Farm yard manure at the rate of 5 cart loads (2½ tons) per acre, supplies plant food to the crops, improve the structure and moisture holding capacity of the soil. The crop grows vigorously and matures early.

Even highly eroded lands respond well to farm yard manure which when applied at the proper time (i.e. when mixed with soil just before rains) decomposes and adds to the organic content of the soil resulting in effective soil amelioration. Experiments have shown that the increase in yield of grain by the application of F.Y.M. was about 15% on an average and for straw it was 10% on an average.

In adverse seasonal condition particularly, effective conservation of moisture and application of farm yard manure have resulted in increasing crop yield.

Compost :

It is recommended that at least 5 cart loads (2½ tons) of compost per acre should be applied so that it would be beneficial for the crop growth and maintain soil fertility.

Tank silt :

This is a good soil amendment and is considered as a bulky manure though it is not all organic in composition. Application of tank silt tends to increase the physical conditions of the soil and can be used with advantage on eroded dry lands. It can be applied at the rate of 5 cart loads (2½ tons) to 10 cart loads (5 tons) per acre or even more depending upon the conditions of the field. This is also recognised as an improved dry farming measure applicable to Tamil Nadu.

Application of fertilizers :

It had been the general opinion that application of fertilizers will not benefit the crop growth on dry land conditions since soil moisture needed for the purpose is lacking in such conditions. However the application of fertilizers has been found to increase crop yield when adopted along with soil conservation and dry farming practices. "Considering the soil conditions of this State and the rainfall and its distribution, it is recommended that at least 100 lb. of super phosphate supplying 15 lb. of phosphoric acid (P205) with a basal dressing of 5 cart loads (2½ tons) of cattle manure or compost should be applied per acre for dry lands".[4]

In loamy soils as in South Arcot District, the groundnut crop is found to respond well to the application of potash and phosphoric manures in mixtures and so 125 lb. per acre is recommended for groundnut crop. Application of nitrogenous fertilizers like ammonium sulphate at 75 lb. per acre so as to supply 15 lb. of Nitrogen per acre together with cattle manure or compost at 5 cart loads per acre is also recommended for groundnut crop in this State.

3. **Seeds and sowing :**

In order to achieve better production, it is necessary to select such of the improved strains which are drought resistant and suited to the locality. Cotton seeds should be defuzzed first before sowing or rubbed with slurry or red earth or cowdung. Sowing may be done either with improved seed drill or by dibbing behind the plough furrow but care should be taken to see that the sowing or dibbing is generally across the slope. Thickly sown crops are thinned in order to increase crop production.

4. **After cultivation practices :**

Weeding and Interculturing : Common weeds which infest dry lands compete with the main crops very badly. Such weeds deprive the main crops of the limited moisture and manure

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4. Soil Conservation and Dry Farming in Madras State by S. Narayanaswamy, Agricultural Engineer (Soil Conservation) published by the Govt. of Madras – 1965).

available to these lands. Weeding and interfilling can be done economically with the help of weeding implements like danthies, spike tooth harrow, blade harrow etc.

Repeated interculturing with blade harrows or hoes will help in the formation of thick mulch of dry soil in the inter spaces which will minimise evaporation of soil moisture from the deeper layers. This will make more moisture available in the root zone and enhance the growth of the plant. Normally 2 weedings are recommended for millet crops, the first one being after 20 to 25 days after sowing and the second one after another 20 days

Experiments conducted at the Dry Farming Research Station at Hagari have shown that mere weeding of cholam had given an increase in yield of 11% and for cotton 15%. When interculturing was done with blade harrows, the increase in the yield of cholam was 17% and that of cotton 19%. Weeding and interculturing helps in the removal of weeds, stirs the surface soil and provides surface mulch of dry soil which prevents evaporation of sub-surface moisture, improves soil aeration, conserves soil moisture and prevents cracking of soil.

5. **Fallowing:**

Fallowing is the practice by which a part of land is kept clean fallow for a full year and in the following year a crop is taken. In deep soils, this practice results in sufficient storage of soil moisture. Keeping the land in an unploughed condition during the period of fallow is said to help conservation of more moisture to be stored and to be made available for the subsequent crop. Such fallowing for a complete year can be recommended for deep soils only, since in shallow soils fallowing may deplete the soil moisture and lower the crop yield.

Experiments conducted in the deep black soils at Hagari have shown that fallowing in alternate years resulted in retaining 6 to 7% more of soil moisture in the first 2 feet layer of soil and can be advantageously carried over to the next crop. As a result increase in crop yield to the extent of even 50% in cholam grain and 38% in straw and 56% of seed cotton could be obtained.

6. **Some mechanical dry farming measures:**

In low and medium rainfall regions and on lands with varying slopes upto 10% *contour bunds* are constructed across the slope and at interval in order to divide the long slope into several strips of smaller ones. There contour bunds intercept the run off due to heavy rains before it attain erosive velocity and inpound water at successive intervals. Thereby soil erosion is reduced and as much rain water as possible is conserved. Soil moisture is also evenly distributed throughout the length and breadth of the field.

It is recommended only for the red soils, since in black soils such bunding allows over stagnation during heavy rainfall which impedes crop growth. In the process of drying, these bunds shrink very badly and develop wide and deep cracks. During the subsequent rains they breach and fail. So construction of contour bunds are not recommended for black soils.

Bund former Bunding: This practice consists of dividing the field into small comparments of about 5 to 10 cents each across the slope by working the 'bund former' and constructing small bunds 7" to 9" in height. They hold the rain water in addition to providing a check to flowing runoff at successive stages. The residual runoff is reduced and more of rain water is allowed to soak into the soil. This also helps in the even distribution of rain water throughout the length and breadth of the field.

Basin listing: This is a method by which the entire field is laid with basins approximately 3 feet long, 1 foot wide, 8" deep to be cut about 4 feet apart. The intermittent furrows or basins formed across the slope impound a portion of rainfall and help to resist the flow of surface run off at successive intervals and thereby reduce soil erosion and residual run off to the possible minimum. The rain water held in the basins is allowed to soak into the land to be available for the proper crop growth. This is recommended in very low rainfall regions where the rainfall is less than 25" and also on clayey soils like black soils.

There are special nutritional diseases in the dry areas such as Lashyrism, and Pellagra. Serious attention should be paid to

upgrading the diet of the farm population if new practices like deep ploughing and bunding are to be accepted and carried out. The introduction of more pulse crops in the crop rotations, the popularisation of high protein maize and other high quality cereals, the cultivation of more vegetables and fruits and the spread of high protein fodder crops should constitute an important component of the new farming technology in dry areas.

I may conclude, that a new deal for farmers in dry areas will infuse confidence and remove a major irritant in economic progress. In this regard, the centrally sponsored schemes, with an allocation of Rs. 20 crores during the IV Plan, to develop dry farming areas may provide the pilot and demonstration experiments which should be universalised for dry farming in Tamil Nadu.

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In the discussion of the paper in the Seminar, a number of points not adequately covered in the paper were raised. Dry crops in Tamil Nadu include red gram, which is a major crop as well as some fruits and vegetables, such as mangoes, cashewnuts etc. The technology of dry farming needs to be re-inforced by further application of science and technology both in regard to its cost structure and its input relation to industry. The recommendations on the technology are too general and should be made specific for every village. A major issue with regard to the cost return analysis is that the dry farmer must be looked at as a unit of production engaged in several lines of production, e.g. two or more dry crops, poultry, cattle etc. From this joint production point of view the computation of costs and returns per household rather than per acre would be of greater significance.

On the problems of credit in dry farming the major issue is management of credit operations. Speed and flexibility in lending, appraisal of loan demands, a tradition for regular recovery and continuous inter-play between the lender and the farmer are urgent in developing credit as a promoter of dry farming. The existing management and procedures of nationalised Banks cannot meet these demands. Dry farming credit must also cover dry crops insurance, which is more needed in dry farming than in wet

farming. A related problem is the development of post harvest facilities, particularly storage, which would also strengthen the credit base of the farmer. Any study of dry farming technology must be related to the agro-based industries which are linked to it as in the case of vanaspathi. In fact such a link will meet the management and service needs of the dry farmers in regard to credit and marketing of the crop which enters as input into the industry. This whole programme of dry farming technology must be backed up by an extensive programme of education, training and information in relation to the dry farming.

SOCIAL JUSTICE IN ECONOMIC DEVELOPMENT *

The theme Social Justice in Economic Development is significant because it sums up the hopes and decisions of people in this country, the plans of governments everywhere and the unanimous decisions of the comity of Nations in the International Development Strategy adopted for the Second Development Decade on October 24, 1970 at New York.

Definitions of Economic Development :

What is Economic Development ? I am going to use it here for a start as being synonymous with economic growth and in that way distinguish between Development and Economic Development. When we speak of growth, we speak of something that can be measured. Economic growth is usually measured by the per capita income, that is the gross domestic product divided by the population. There are a number of admitted limitations to this measure. The most obvious ones result from imperfect or non existent statistics which make GDP estimates guestimates. A second limitation arises from the problems of translating per capita money incomes into per capita real incomes in which all sorts of variables, social, cultural, and environmental must be taken as given. A third problem is that the measure can only deal with averages and these averages are notoriously non existent. A landless harijan labourer, and a gazetted officer do not average out to the Neyveli Lignite worker. A Ph. D. working in the Institute of Mathematical Sciences and a failed PUC student do not average out to a higher education for two. Similarly the average income of the farmer may be going up but that increase could be infinitesimal in terms of the higher rises in prices of sugar, cloth, salt and kerosene that he needs. Here we would have a rise in per capita GDP and an actual fall in the standard of living of the

* Extracts from the Presidential address delivered by Dr. Malcolm S. Adiseshiah to the Economic Conference of the Southern India Chamber of Commerce and Industry at Rajaji Hall Madras on 30 January 1971.

people. Is this what is happening to our rural people who constitute over 70 per cent of our population? Fourthly, and as a consequence, the per capita measure is only part of a larger mix, which all of us are familiar with and which we call levels of living. The United Nations distinguishes 9 components which make up this level: health, food consumption and nutrition, education, employment and conditions of work, housing, social security, clothing, recreation and human freedoms.

Taking all these factors into account, I believe that the rate of growth of an economy over a time span constitutes relatively a more reliable indicator of economic development. This is a concept borrowed from biologhy and goes back to one of the conclusions of Alfred Marshall that the Mecca of the economist is economic biology rather than economic dynamics. This method of measuring economic development indicates the trend or direction in which the country's economy is moving. Growth rates derived from GDP give a picture not simply of the current volume of production but changes in the volume over time and even more of the country's ability or capacity to produce. This distinction between the total volume of physical production and the capacity to produce, productivity, is of decisive significance in growth economics.

Definition of Social Justice :

Social justice has many facets and implications. Its portrayals vary from the classic Utopias of Plato's Republic, aimed at building a better city in the hearts of men, to More, St. Simon and H. G. Wells calling from each according to his ability and to each according to his needs, to Marx, Mao and Fidel who delineate their egalitarian systems through the revolt and rule of the proletariat or of the rural peasantry, or of the disaffected intellectuals, on to Arnold Toynbee's etherealisation of mankind, Teilhard de Chardin's Noosphere and Marcus who argues that today's technological society has concentrated undue power in the hands a few political and economic monopolies, who then proceed to suppress the freedom of a paralysed citizenry. Social justice in this context is equated with the removal of this surplus repression and the eroticising of society.

I will however use what I believe to be a simple and somewhat comprehensive characterisation of social justice. It is that of reducing, with a view of gradually eliminating, the gap, political, social, economic and cultural, between the rich minority and the poor majority in a country. In its simple and popular form it is expressed in the draft constitution of one of our neighbours, Ceylon, among its fundamental objectives, the distribution of the social product equitably among its citizens.

Economic Development versus Social Justice

I think that we must begin by admitting the possibility of a conflict between the two objectives. In fact during the Sixties which witnessed a growing consciousness and understanding of economic development under the stimulus of the United Nations proclamation of the First Development Decade, it was found that the countries in the third world which registered the highest growth rates also experienced a worsening of distributive justice. This antinomy between economic growth and social justice to be simultaneously the responsibility of every one and no one. In the developing countries economic development came to be equated with the country producing or assembling its own motor cars, air-conditioners, electric goods, soap etc. which had little relation to progressive tax reforms, raising the productivity of agriculture, mass education and health services. Even the drive for expanded exports resulted in the use of foreign exchange earnings to import consumer or capital goods for luxury products. Equally the developed countries searching for productive investment and bankable projects in the developing countries, provided public aid for energy, water and transportation, allowing oil, steel shipping and consumer goods assemblage to develop as the cooperative domain of the private sector. In this division of investment, education, health, land reform, housing and an equitable social and economic order were termed social impact projects which had to go a-begging for the financing of their urgent development.

Another instance of the conflict between economic development and social justice is in the relationship between wages, productivity and employment. When wages cease to be a form of charity and begin rising sharply, employment is contracted to those whose productivity meets the test of high wages. A two

sector economy follows, a highly productive sector using capital, and modern technology, and paying high wages, and the rest of the economy in a second sector. Usually wages in the modern sector are about 50 to 75 per cent higher than in the rural sector. This meets the demand of the modern sector for skilled labour, but it also means that its wages cannot rise with a rise in productivity in that sector. Its increased productivity must go to profits, or taxes or to the rural sector, via improved terms of trade for that Sector. It is known that the modern sectors in 19th century England and 20th century Japan expanded very considerably at constant real wage rates. But in India and in developing countries generally, due to trade unions, a social conscience among capitalists and governments which support the claims of workers in the organised sector, sharp wage increases in that sector have occurred. The results are first reduced employment opportunities in the modern sector and the use of capital intensive technology. Further these high wages lead to an explosion of urban populations. When the urban wage was only 50 to 75 per cent higher than the rural, part of which is absorbed in higher urban living costs, demand and supply are in equilibrium. But when the urban wage is three or four times the rural wage, the influx of rural labour into the cities, seeking non existent jobs, with all the many urban side effects, cannot be stemmed. Adverse effects are also felt in other industries. The correlation between the rise in wages of our power, engineering, steel, lignite and other industries leads the rural sector to end its shielding of surplus labour, which is then thrown openly onto the labour market. Disguised rural under employment shows up as overt unemployment. One of the factors in the growing unemployment picture of the country is this question of the relationship between wages, productivity and employment in the organised sector.

Social Justice in Economic Development :

The theme of this conference, Social Justice in Economic Development, however, brings us back to the truth that there is no real opposition between economic development and social justice, if we view economic development as Development. Development for me is the movement of a social system cemented by technology, economics, social and political structure, religion, language

and values, of which the change induced by economic growth is only one sub system. The pursuit of wealth or the increasing of profits are not automatic and decisive standard setters to which educational instruction, family obligation and social values must conform. Rather in order to make people seek an increased quantity of goods and services such values as power, respect, rectitude, affection, well being and enlightenment must be reshaped and shared.

Last year when I was on a visit to one of the Meghrabian countries, I heard of a fisherman stretched out happily in the warm sun by a huge and shimmering lake and the following conversation ensued :

" Why are you not out on the lake fishing ? "

" Oh, I caught a big haul yesterday which brought me enough in sales to last me for three days, so why should I fish today ? "

" Because if you fish today, you can have more money than you have today. "

" That is true. But why should I have more money than I have today ? "

" Because with more money you can buy a large mechanized fishing boat".

" That is true, but why should I have a large mechanized fishing boat ? "

" Because with it you can catch ten times more fish and have ten times more money."

" That is true. But why should I catch ten times more fish and have ten times more money ? "

" Because with that money you can build yourself a large palatial house and a swimming pool."

" That is true. But why should I have a large palatial house and a swimming pool ? "

" Because you can then enjoy life and lie in the sun lazily all day."

"That is true. Ah, but that is what I am doing now, am I not?" So defined, development is a function of a series of variables, the economic variables of industrialisation, urbanisation and national income level, the enlightenment variables of schooling, literacy and media exposure, the power variables of participation, party membership and voting, the personality variables of motivation, need-achievement and empathy, the ecology variables of population, organisation, and technology, together with the principles of co-operation, differentiation and inter dependence. Development must thus be conceived in a holistic, organic, dynamic, valuational manner.

At this point it is well for us economists to recall that economic interest in social justice is very recent. Even as recently as 20 years ago social questions were regarded as non quantitative and left to the second class citizens in the social sciences-Sociologists, Anthropologists, Psychologists and others of the lesser breed. Work on *economic development concentrated* on the development of economic growth models, the Harrod-Domar model of average and incremental capital output ratios, of rates of saving and investment, of closing and widening gaps in GNP. When the validity of these quantities, GNP, Capital and Investment and Saving, were questioned, when it turned out that the rate of investment is determined primarily by the investment opportunities, which is a function of the quality of the people, which involved in turn pre-investment work; when the utilization of such opportunities was seen to be a matter of motivation, communication and social infra-structure, the economist then entered full *tilt into questions of social justice and problems.*

And so from the Consumption-Savings-Investment model calling for a tightening of the belt in the interests of economic development, we moved to the Keynesian model of simultaneous *consumption and capital formation*, allowing us to eat our cake and keep it, (in fact to keep our cake we had to eat it), on to the human investment and human capital model which with its misleading distinction between productive investment and consumptive expenditure, misleading— because both are aimed at welfare, only consumption is direct welfare, we have arrived today at the development model which defines development as

growth plus change. Today we know that improvements in the quality of people are simultaneously consumption and investment, objective and instruments, the demand for resources as well as the supply. Health measures are the instrument for improving the quality of people, but better health is also the desired result and is in turn a source of increased productivity which provides the resources for further health expenditures. Better housing, social security and equitable land tenures are the instrument but also the objective. Better food is the instrument but better nutrition particularly of our rural peoples is also the objective. Better education and training is the instrument of change, but the better educated man is also the objective. Thus Development is the realisation of Social Justice.

Six Imperatives:

Against this general background, social Justice in economic development imposes on us in India six imperatives—all of which are well-known, but which nevertheless bears reiterated repetition·

First, an agricultural policy which is aimed at the full and comprehensive development of the country's agriculture. This involves intensification of the high yielding varieties of the five food crops of rice, wheat, sorghum, millet and maize. It also requires developing and utilising a similar technological package for pulses, oil seeds, cotton and jute fibres, fruits and vegetables as well as animal husbandry and fisheries. Such packages must be developed and made available to the majority of our farming population, 80 per cent of whom are engaged in dry farming.

Second, an industrial policy aimed at a balanced development of our manufacturing establishments with their attendant economies of scale, greater use of intermediate and labour intensive technologies and speedy growth of small units, and real partnership between the public and private sectors. My own experience is that the private sector in the country is as efficient as and more inventive and speedy than these in the developed countries and should be given every inducement to increase its efficiency and output. Further our import substitution policy seems to be landing us in a vicious circle. We are pricing ourselves out of both internal and international markets. Many of our consumer

or machine goods are two or three times the international price. I believe we are all familiar with the fact that in 1965 the developing countries spent $ 2.1 billion to manufacture cars and automotive products which had an international valuation of only $ 800 millions. A similar tale applied to our airconditioners, refrigerators and other electrical goods. A related issue is the underemployment of our capital equipment and of the growing surplus capacity of many of our large public sector undertakings. There is more than coincidence in the coexistence of massive under utilization of our human resources and the growing unused capacity of our large industries. This ought to be immediately and easily remedied.

Third, a fiscal policy which through taxation, grants, subsidies and credit facilities and rationing ensure a transfer of real resources from the well to do minority to the poor magority. In terms of legislation and political intent, this objective seems to be well on the way to realisation in the country. Our tax structure and the grants and subsidies and other control system seem to be one of the most developed in the world, certainly in the third world. But the effects in terms of social justice are minimal. Tax evasions and black operations seem to be growing while compensatory resources are not reaching the poor, rural people, in whose name and for whose benefit this elaborate policy has been devised. A fiscal and administrative overhaul is called for.

Fourth, a wages and prices policy is needed in order to ensure that the current rural-urban terms of trade which are stacked against the rural people are corrected. This stacking of the terms of trade proceeds from several causes. There is hardly an agricultural prices policy. Shortages of consumer goods such as cloth, sugar, kerosene etc. is another factor. I agree with the comment that there is no greater denial of social justice than a system in which shortages, which are avoidable, are allowed to persist. Then there is the need to establish some kind of relationship between wages, prices and demand. We seem to be pricing even our necessities, not to speak of the consumer goods for the middle classes, out of the reach of our long suffering rural masses who are our silent majority. I have already posed the problem of wages and productivity. The kind of examples provided by the

growing costs and prices of sugar, steel, lignite in terms of the escalation of interest charges, salaries and incomes and various forms of taxes needs pondering over, not simply as a means of ensuring an increasing GDP but also of preventing the cut in consumption and the lowering of the levels of our silent majority, which is taking place.

Fifth our population and family planning policy needs to be more effectively applied. Our total of goods and services has increased 300 per cent during the sixties, but our per capita income, that is the standard of living of the rural people has increased only by 20 per cent from Rs. 248 to Rs. 297. Our excessive population growth is a major reason for the fact that in terms of welfare and social justice we are standing still even as we are racing economically. The present growing awareness of our demographic challenge should be turned into a policy and a programme in which all of us, can and must actively participate.

Finally, a social policy is needed which implements a programme for a rapid expansion of a reformed and innovative education and training system including the early liquidation of adult illiteracy, a comprehensive and effective employment policy, an improved and far sighted health and nutrition programme, particularly to deal with the malnutrition of pregnant women and the pre school child in the rural areas, and a rational housing policy for both urban and rural areas.

I conclude by underlining the doctrine on which this conference is based. Development is people Development is by and for poople. Its alpha and omega, its beginning and end, are human values and goals, human feelings and emotions. This is also Unesco's doctrine. Not only is man at the origin of development, not only is he its instrument and beneficiary, but above all he must be regarded as its justification and end.

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A FIRST CENSUS OF SOCIAL SCIENCE RESEARCH IN TAMIL NADU

A wide range of Social Science Research is being undertaken by the three universities and their constituent colleges and by other research institutions in the State. This first census of such research is both incomplete and not uniform. It is incomplete because the research programmes under way in the University of Annamalai and some of the affiliated colleges of the Madras University have not been reported. The report does not follow a uniform format because while for most programmes only the title is indicated, for a few others a brief summary of the purpose and method of the research programme is given. In all six of the social science disciplines, the heavy emphasis on the problem oriented approach, the study of local and national problems may be noted. No distinction has been made in this first census to distinguish between research, studies and documentation.

A. **Sociology**: Madras University.

1. Fertility, Fertility Orientation and Social Psychological **Correlates**:

The objective of the study is to identify the social psychological factors determining the third child birth among the women with two children. The study concentrates on the urban women in the three family planning service areas of Madras City. The preliminary work regarding the schedule preparation is under way.

2. Fact-finding survey of slum area in Madras and a village nearby Madras.

The study proposes to find out the level of literacy, income, family size, earning and unemployed persons, nutritional level, the available mode of socio-economic institutions and services existing in the community, power structure and attitude towards various problems and aspirations and needs. The slum areas around Chetput Railway Station are to be surveyed. The house holds may come to over 600 and the population will be near about

4000. Further, a village near Meenambakkam is selected for a rural survey work. This fact-finding survey will facilitate realisation of certain programme objectives laid down by the recent conference on 'Continuing Education' organised by the Indian University Association for Continuing Education in collaboration with the University of Madras.

3. Changing patterns of family and marriage among the Ezhavas of Trivandrum :

The study will identify the social history of marriage and family in one particular community in Kerala.

4. Villager's frames of reference of development programmes:

A small survey on the villager's frame of reference about the role of Block Development Institutions and its personnel is being carried out. The objective is to identify the villager's role-expectations and role perceptions of developmental institutions such as primary health centre, women and children welfare centre, co-operative societies and about the various categories of personnel working in these institutions.

5. Marriage and Natality Patterns:

A study on marriage and natality patterns is carried among 200 married women. The objectives are to study the general sequence in the timings of events in marriage leading to completed family, the relationship between marriage potential and marriage patterns and the sociological correlates of the natality levels and marriage pattern,

6. Married industrial women employees in Madras City.

The study has the following objectives.

a. What does the wife's decision to work involve for her as a wife and mother?

b. What does it mean to her husband?

c. and finally, what does it mean to her children ?

The population for the research project is restricted to the married industrial women employed in Madras City, Based on

stratified sample, 250 such women will be selected. A preliminary study has already been carried out to pre-test the questionnaire. Annamalai University.

7. Social changes and Rural Problems with particular reference to Chidambaram Taluk.

B. **Anthropology** : Madras University,

1. 'Vellalas of Tamil Nadu'—A study in socio-cultural Anthropology: An ethnographic study of its life as it is constituted at present.

2. Koother : A Tanjore Village—A study of changing patterns of land and power distribution.

C. **Social work** : Loyola College, Madras.

1. Trade Union Leadership in Madras City: For this study thirty trade union leaders from the registered and recognised trade unions in Madras City were selected. An Interview Schedule was used for collecting the data from the trade union leaders. This original study has brought to light the personality qualities of trade union leaders, their main functions, their tactics, their views on labour problems, and the difficulties experienced by them in carrying out their duties.

2. Managements' Attitude towards Trade Unions : Twenty industrial estabiishments in and around Madras City were selected and the Managers/Personnel Managers were interviewed. According to the report, Managements favour one union in one industry; they prefer trade union leaders who are their own employees to outside politlcians. "Politicians use trade unions as means to achieve their own ends." Managements' attitude towards trade union activities are carefully analyzed by the Report.

3. Motivation of Workers to Join Trade Unions : This study was conducted in Western India Match Company, Madras. To select the 100 respondents, stratified random sampling was employed. According to this study. workers join trade unions in order to increase their wages, to have a part in collective

bargaining, to find solution to their problems, to increase welfare facilities; to ensure safety measures, to have job security, and to be able to express their demands without fear of victimization, to fight for more bonus. Workers also join trade unions just to please their co-workers.

D. **Home Science:** Sri Avinashilingam Home Science College, Coimbatore,

1. Decision making practices of selected urban home-makers.
2. Installing electrical and plumbing facilities in a remodelled guest house.
3. Savings patterns of selected college students.
4. Outcomes of the application of selected work simplification principles in the management of a school lunch kitchen.
5. Income expenditure pattern in a selected village.
6. Designing and evaluating a low-cost device for storing vegetables.
7. Evaluation of the home management residence experience in the under-graduate programme.
8. Managerial benefits accruing from effecting some improvement in a poultry unit.
9. Evaluating and strengthening a rural girls' club.
10. Time and motion analysis for selected household activities in two low cost houses.
11. Effects of an ANP Feeding Programme on the nutritional status of nursing women.
12. Impact of an Applied Nutrition Programme on the nutritional status of pre-school children in a village.
13. Heights and weights of two thousand five hundred 5 to 9 year old girls in Coimbatore city.
14. Availabilities of iron from Amaranthus Flavus, iron salt and tonic to children in a School Lunch Programme.
15. Nutritive value and acceptability of deoiled rice polishings.
16. Biological evaluation of the protein quality of deoiled rice polishings.

17. Comparison of the contribution of iron by Amaranthus, Collodial iron and iron salt as daily supplements in a School Lunch.
18. Nutritive value of three high yielding rice varieties Jaya, Padma and Hamsa.
19. Acceptability of selected food preparations utilising rice brand oil.
20. The nutritional status of expectant wowen in an ANP village.
21. Effect of supplementing green leafy vegetables on the nutritional status of children, participating in a rural School Lunch Programme.
22. Effectiveness of the Textiles and Clothing courses of B.Sc. (Home science) curriculum in home living.
23. Educating college students towards solving their problem of clothing care.
24. Comparison of economics of yarns spun by Ambar Charka (Textool and mill).
25. Effectiveness of two selected cake soaps on white long cloth.
26. Standardising and developing a pattern for Choli.
27. Developing and constructing two selected patterns for pre-school children.
28. Evaluating different methods of hand washing on white long cloth.
29. Preferences of selected urban home-makers for home furnishing materials.
30. Aspirations and attitudes towards education of selected adolescent girls in five villages.
31. Language ability of children in rural and urban pre-Schools.
32. Influence of education on women in their adjustments during the first year of marriage.
33. Influence of an ANP feeding programme on the food habits of pre-school children.

34. Marriage and family planning as viewed by adolescents and their parents.
35. Re-organisation of the Balwadi in Pannimadai villages. (Coimbatore District)
36. Child rearing practices of employed and un-employed mothers.
37. Influence of family size on the social, physical and academic achievements of adolescents in two selected high schools in Coimbatore.
38. Knowledge and attitude towards sex of selected adolescent girls.
39. Influence of education of women on limiting family size.
40. Vocational interests of school final year adolescents.
41. Infant weaning Foods.

A survey was carried out on infant weaning practices in 470 families in 8 villages in Perianaicken palayam block, Coimbatore district. In the selected villages, the presidents, head-men of the villages, teachers, home makers, shop keepers, and the farmers were contacted and data on locally available protein rich foods were gathered.

With the locally available food stuffs, suitable recipes for infants were formulated and standardised. The recipes thus standardised carried considerable amounts of protein, calcium and iron. One serving of these ready mixes can contribute protein from 9·8—10·5 gm. and calories from 385 — 300. The cost is 10 P/serving approximately. Further work is in progress to feed 200 children with the ready mixes.

42. Iron supplementation.

The aim of this project is to find out the availability of iron from green leafy vegetables—amaranthus green—to school children as compared to that available from iron salts.

One hundred and thirty eight children who were participating in the school lunch programme at Shri Avinashilingam Elementary School and Sri Sarada Devi School, and comparable in age,

height, weight and haemoglobin levels were selected and divided into four groups and designated as follows :

E1—School lunch supplying 7 mg. iron.

E2—School lunch plusiron tonic supplementing 13 mg. iron.

E3—School lunch-Amaranthus supplementing 13 mg. iron,

D —Non-School lunch.

The criteria selected for the evaluation of the availability of iron were: height, weight, haemoglobin levels, Packed Cell Volumes (PCV) and RBC count. The home diets of children were analysed by weightment survey.

43. Community Nutrition Projects.

In the village Narasimhanaickenpalayam 12 M.Sc., students of the first year majoring in foods and nutrition conducted diet surveys among 342 house-holds through the oral questionnaire method. Information regarding food budgets, types of foods used, food practices, dietary habits and food beliefs was elicited. Food consumption surveys were conducted on selected groups such as preschool children, school going children, adolescents, expectant women and nursing mothers by the weighment of both raw and cooked foods.

44. Influence of nursery school education on the subsequent development of children in first grade.

The four major aspects selected for the study are ' physical, intellectual, emotional and social development '. The study is undertaken to evaluate the influence of nursery school experiences on the development of children.

The collection of data for 60 children, 30 of whom had attended nursery school and 30 had not is undertaken. The children selected are comparable in age and income of parents. The analysis of the findings show that children who had attended nursery school were superior in all the development aspects. During the current year 80 more children have been selected and the work is in progress.

E. **Political Science :** Annamalai University.

1. The Roll and powers of the President of India.
2. A comparative study of the problems of federalism in India and the United States.
3. The Chola feudatories.
4. The Governors of Fort St. George 1755—1785.
5. The Roll of the Governors under the Constitution with special reference to the period since 1967.
6. Parliament's Attitude to U. S. A.
7. History of the Franchise in India.
8. Toynbee's Interpretation of Indian History.

F. **Psychology :** Annamalai University.

1. Mental Health Problems of University and College students.
2. Attitudes and Adjustment problems.
3. Interests and Attitudes of educated women towards occupation and Home-making.

Madras University

4. A Study of Personality problems of pupils of age range 8-16.
5. A study of fatigue as related to extraversion-intraversion in an industrial setting.
6. The Psychological study of widows in comparison with married and unmarried women.
7. The origin of prejudice in children—A psychological study.
8. Personality and suggestibility.
9. Personality factors in accidents.
10. Personality as a factor in susceptibility to persuasion.
11. A study of creativity and its relation to level of aspiration among adolescents.
12. A study role of sex and socio-economic conditions on the value patterns of adolescents and their relationship to adult values.

13. Psychological aspects of Recidivism.
14. Some factors associated with scores on Draw-a-man test.
15. Study habits of Tenth Standard students.
16. Factors related to English Handwriting.
17. Study habits of Trainees in the Air Force Training School.
18. A study of adherence characteristic in relation to Zeigarnik effect.
19. A study of appreciation of poetry in relation to imagination.
20. A study of personality types in relation to low and high achievement among teacher-trainees.
21. Errors in the progressive matrices test among the mental retarded children.
22. Psycho motor aspects of mental retardation among children.
23. Psycho motor performance in Epileptics.
24. A study of goal adherence among the abnormal and normal people.
25. A study of goal behaviour among the abnormal.
26. A study of memory disturbance in schizophrenic patients.
27. A study of deterioration in schizophrenic patients.
28. A study of schizophrenic behaviour in a problem solving situation.
29. A multi-dimension approach to the study of Psychosocial factors underlying Juvenile Delinquency.
30. An experimental study of conflict as related to stimulus gradient and personality with a view to determining the dynamic role of conflict in the inner core of abnormal personality make up.
31. An experimental study of adherence tendency in goal behaviour.

G. **Economics**: Annamalai University.

1. Capital Formation in the Agricultural sector in the Thanjavur District.
2. Production and Marketing of Tobacco in Tamil Nadu.

3. Growth of General Life Insurance in India since Independence.
4. Centre-State Financial Relations.
5. Production and Marketing of Banana in Madras State.
6. Agricultural and Non-Agicultural Labour in Thanjavur District.
7. The changes in the Tax Structure of Madras State since Independence.

Madurai University.

8. Balance of payments problems of a development economy - with special reference to India.
9. Land reforms in the Madras State.
10. Transport problems in a developing economy.
11. Capital formation in the agricultural sector in Mudurai District.
12. Small scale entrepreneurship in Madurai District.
13 Problems of marketing of cash crops in Madurai District.
14. Transport Industry in the private sector T. V. S. of Madurai—a case study.
15. Cost and Benefit Analysis of University Education with special reference to Tamil Nadu.
16. Finances of the Madurai Municipality.
17. Gandhian Economics—the efforts made towards decentralised production of Gandhian lines in the area served by the University.
18. Agricultural Finance.
19. Textile Industry in Madurai District.
20. Interstate Comparisons of the patterns of consumption—expenditure.
21. Development in Family Planning.

University of Madras.

National income :

22. Concept of National Income with special reference to under developed countries.
23. Growth of National Income in India with reference to contribution of Agriculture.

Welfare Economics :

24. The Theory of Economics Welfare.
25. The Theory of consumption with special reference to Milton Friedman's consumption Function.
26. An Economic Study of a Tribal Community with special reference to Malayalees and their co-operative organisation in Kolli and Javadi Hills of Madras State.
27. Education and Economic Development with special reference to South India.

Public Finance :

28. Economic Federalism in India—A case study of Tamil Nadu.
29. Redistribution of Income in India through Public Finance—A Theoretical Study.
30. Taxation and Industrial Development in India with special reference to Madras State from 1955 to 1969.

Monetary Economics :

31. Overdues in Rural Credit Societies (based on a field survey in North Arcot and South Arcot districts).
32. Supply and Demand for Medium Term Loans (based on a field survey in Madurai and Trichy districts).
33. Central Banking in India.
34. Bank Charges in India.
35. Centre-State Financial Relations in India.
36. Madras Mint.
37. The changes in the structure and functioning of the cooperative credit societies and the role of credit in Package Programme Area (Thanjavur District).
38. The changes in the structure and functioning of the cooperative credit societies and the role of credit in West Godavari (A. P).
39. Loan utilisation of Land Mortgage Banks in Coimbatore and Thanjavur.
40. Industrial Development Bank of India.

Industrial Economics :

41. A report on Cost of Living Index Numbers.
42. Studies in Cost Structure in Industry.
43. A theory of profit; an inquiry into the Marxian analysis.
44. Economics of Mechanisation of Fishing in Kerala.
45. Industrial Development of Madras with special reference to Labour.

Economics of Transport :

46. The Economics of Road Transport in India with special reference to Madras State.
47. Transport problems in an underdeveloped country.

Agricultural Economics :

48. Intensive Agricultural District Programme and Agricultural Development.
49. An evaluation of the High Yielding Varieties Programme in Krishna, Thanjavur, West Godavari and Chingleput District.
50. An enquiry into the working of fair price shop in southern region.
51. An enquiry into the piggery development in Krishna District.
52. Agricultural Price in Madras State since 1939.
53. Study of Agricultural produce and the Co-operative marketing Societies (North Arcot District).

Madras Christian College, Tambaram – Dept. of Economics.

54. A Study of Comparative Cost Structure in Cotton Textile Industry and Man-made Fibre Industries in India and in Some Selected Countries.

This Study attempts a comparison of the cost components of Cotton and man–made fibre industries in India and Japan. It concentrates on two questions: (1) Both India and Japan have been manufacturing cotton textile for a long time. Of late, performance has been poor of Indian cotton textile industry while

Japan's performance has been good. How is this phenomenon to be explained? (2) With the development of man-made fibre industry, both the countries have gone in for the manufacture of these new fabrics. Does this make any difference to the future development pattern of the cotton textile industry?

55. "Financial Structure and Economic Development".

This study is mainly concerned with the analysis of the financial structure of a developing economy with special reference to India. More specifically, the study is an attempt to find answers to three questions concerning the financial structure and economic development. First, are there structural changes, both quantitative (growth) and qualitative (diversification) in the financial system in the context of economic development? Second, if there are changes, how are the different aspects of financial structure – financial assets, institutions and markets—affected by these structural changes? Third, how best can these changes be analysed and explained? The empirical part of the study is based on the flow of funds accounts of the Indian economy between 1951 and 1966.

56. "A Study of Progress of Indian Industries".

This study is concerned with finding out progress made by the Indian Industries during the 15 years, 1950 to 1965 concentrating on the following questions : (1) Does the progress during the period show any definite pattern or trend? (2) What are the causes for the progress? To what extent is it due to: (a) Technology (b) labour productivity (c) capital productivity.

57. "A Study of the Demand for Fertilizers in Chingleput District."

The study attempted to discover the pattern of distribution of fertilizers in Chingleput District and the role of the co-operatives, the Block Development Offices, the commercial banks and the private dealers in the distribution process. A projection has also been made of the demand for fertilizers for the coming two years.

58. "The Unorganised Sector" of the Indian Economy.

The main thesis of this enquiry was that the so-called *unorganised sector consists of* producer-households which are

consuming - producing - saving-investing units and that micro level studies of their economic motivations and behaviour are necessary to get an understanding of the working of the Indian economy.

The study has yielded some hypotheses which have not been fully tested : (1) That the class of entrepreneurs who take to this kind of business are ones who migrate and keep on moving from high population areas to low population areas: (2) That in terms of an efficiency ratio defined as profit per unit of resource the smaller units are generally more efficient than the larger ones; and (3) That in the type of activity considered here it is necessary to distinguish between the incentives to maximise returns per unit of enterprise and incentives to maximise return per unit of resource. Maximisation of return per unit of resource requires the unit to be big.

4. **College of Rural Higher Education, Coimbatore**:

59. An enquiry into the marketing operations of a Co-operative marketing Society.
60. Communication process in the Handloom Weavers' Co-operatives.
61. The pattern of member beneficiaries of a Co-operative Urban Bank in relation to the pattern of its membership.
62. The personnel management in District Co-operative Marketing and Supply Society.
63. A study of the purpose, use and supervision of Co-operative credit.
64. A study of the savings pattern of the member of an Urban Co-operative Bank.
65. A study of the relation between member investment and member participation in Agricultural Credit Societies.
66. An enquiry into the availability of Co-operative credit to small farmers.
67. A study of the operational efficiency of Agricultural Credit Societies.
68. Community factors that influence the working of Agricultural Co-operative Credit Societies.

69. A study of members' attitude towards Agricultural Co-operative Credit Societies.
70. A study of the social values in relation to member participation in the agricultural co-operative multipurpose societies.
71. An assessment of the working of a Co-operative/Rural Housing Society.
72. Factors affecting, securing and repayment of credit by small farmers.
73. A study of factors affecting economic conditions of landless labours in Coimbatore District (Tamil Nadu) in the context of Agrarian Changes.
74. A study of attitude of men towards Family Planning.
75. The impact of Branch-banking on the mobilisation of resources and on credit services of a Central Co-operative Bank.
76. A sociological study of direct election of village Panchayat Presidents.
77. A research project for the construction of a scale to measure the socio-economic development of rural communities.
78. An action research programme on maintenance of farm accounts by farmers.

5. Institute for Techno Economic Studies, Madras.

79. "The Structure of Cigarette Industry in India."

The study traces the history of the cigarette industry in India-its past, present state and future trends; its capital and economic structure; rate of growth of the industry and forecast of demand for cigarettes in India in the next ten years; its export possibilities; and an assessment of the different production factors and handicaps of the indigenous industry and suggestions to overcome them.

80. "Medical Manpower Requirements for the State of Tamil Nadu in 1980."

The study was undertaken to assess the present and future requirements of doctors to man the teaching institutions, Primary

Health Centres, ESI institutions, Taluk hospitals, and Family Planning programme with reference to the Development of Medical Education, Health programmes of the State during the Fourth Plan and also for recruitment of doctors in the Army during normal time and during national Emergency. The study was limited to registered allopathic doctors and dentists in Tamil Nadu.

6. **Madras Institute of Development Studies, Madras.**

81. Economics of Dry Farming Technology in Tamil Nadu.

(1) 34,53,990 hectares of land in Tamil Nadu depend on scanty rainfall for cultivation according to the season and crop report of 1967-68. For the total agricultural development of the country, urgent attention needs to be focussed on unirrigated farming as only 20% of the cultivated land is under irrigation and 80% is farmed under rainfed conditions.

Certain imperatives pose themselves for consideration. Have we evolved suitable varieties for cultivation in dry lands? What is the stage of evolution reached in such varieties? What are the future lines of action? What are the agronomic practices to be adopted? How can soil erosion be checked on a massive scale? What are the practices that would most suit the soils of Tamil Nadu? How can the limited water resources be stored? The three economic issues of this study are (a) the cost and returns of the technology (b) the credit needs and (c) the marketing facilities available to the dry farmer. Some recomendations for the development of Dry Farming Technology in Tamil Nadu will be suggested in this study.

82. Social Stratification and trends in income earnings and distribution of the Harijan Community in Tamil Nadu.

This project is a part of the larger study undertaken by the I.C.S.S.R. on an all India basis. The main objectives of the study are 1) to examine the trends in income earnings and distribution among Harijan from the year 1950, 2) to make trend projections of their earning capacity in the Seventies. 3) To analyse changes in their social status during last 20 years 4) propose alternative programmes for increasing their income earning capacity and

improve their social status. The present study is primarily in the nature of a survey. Since it is estimated that the majority (73%) of the population of Tamil Nadu resides in rural areas, attention is focussed on the village population which have been less influenced by urban forces. It will also make a comparison of the economic and social status of 1) the Harijan and non Harijan communities 2) and among Harijans of those who are above and below 35 years.

83. Rural Employment profile in Tamil Nadu.

The present study is intended to review (a) the size, nature, characteristics and composition of the rural labour force in Tamil Nadu (b) current employment generation programmes being undertaken by the State Government and private sector and to make proposals for additional alternative programmes for rural employment. More specifically the study attempts (a) a quantitative assessment of visible and open unemployment prevalent in the rural areas, (b) a statistical measure of the nature and magnitude of underemployment, (c) a review of occupational and status composition of those classified as gainfully employed workers, (d) an analysis of the conceptual background of different estimates of unemployment in rural Tamil Nadu (in particular as set forth in the National Sample Surveys 14th, 15th 16th, 17th 18th rounds), (e) a study of ways and means of dealing with rural unemployment and underemployment with special reference to the rural works programme and its failure in Tamil Nadu, (f) proposals for alternative employment programmes while examining their feasibility and potential success. The major sources of data used are the decennial censuses, the various rounds of the NSS beginning with 1952, the employment market information (EMI) programme and the employment exchange data collected and compiled by the Directorate of employment and training.

84. Urban-rural terms of trade of Tamil Nadu.

It is widely believed that the terms of trade are discriminatory as regards the rural areas. The study is directed to (a) establishing the terms of trade of the rural community in the State vis a vis the urban (b) identifying the causes for the unfarourable

terms and (c) proposing alteranative programmes, compensatory and regulatory, to improve and ultimately equalise the terms of trade between the two communities. The data for this study is drawn from a part of the replies to the wider questionnaire administered in the forty Tamil Nadu villages referred to under project No. 75 and the information available in the 18th round of the National Sample Survey.

85. State of Rural primary education and literacy in Tamil Nadu.

The State is currently spending Rs. 30 crores on primary schooling and claims to have enrolled 93% of pupils in the age group 6-11. 39·39 of the people in the State are reported as literate in 1971 census. The study aims at (a) quantifying the wastage in rural primary schooling and the cost of rural illiteracy (b) evaluating in rupee terms the main factors leading to rural primary school wastage and illiteracy (c) analysing and identifying the socio-economic and cultural factors giving rise to wastage and illiteracy (d) proposing programmes and reforms to reduce rural school wastage and (e) suggesting means of financing a time bound literacy programme for rural Tamil Nadu.

RESEARCH METHODOLOGY IN ECONOMICS

Impressions of the Six Week Workshop

By

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The Summer Workshop on Research Methodology in Economics which was held in Madras christian College, Tambaram from May 3 to June 12 was a significant event for more than one reason. There have been occasional consultations and training courses on research methods in South India in the past, but the Summer Workshop was quite unique and nothing of its kind has ever been attempted in the past. For one thing, it brought together for the first time research scholars and research supervisors from all ten South Indian Universities., Andhra, Annamalai, Bangalore, Karnatak, Kerala, Madras, Madurai, Mysore, Osmania and Sri Venkateswara (Tirupati). Secondly, compared with the two or three day or one week consultations on research methods of the past, the Summer Workshop met for six weeks, all but a few staying on from the first to the very last day in residence in Tambaram, thus creating something of a modern 'gurukul' as one of the participants aptly described it. Thirdly it was a *Workshop*, not only in name, but in terms of its programme and procedure as well.

The Background :

The Workshop owed its inception to three regional conferences of the Indian Council of Social Science Research which were held in the months of Janurary and February in Madras, Trivandrum and Bangalore where the participants strongly urged the ICSSR to organise courses in research methods for the benefit of research scholars in various disciplines. In February Dr. Adiseshiah, who took a leading part in the regional conferences of the ICSSR took up the responsibility to organise the training course for research scholars in Economics. The partici

pants were selected by the Universities themselves, on the basis of an allocation decided by an ad hoc committee which was responsible for the organisation of the Workshop. The representation for each University was based on the number of active Ph. D candidates in economics as revealed by the recent directory of Ph. D candidates compiled by the ICSSR. The first circular to the Universities was sent by the middle of February and nominations started arriving by the first week of March. The Director of the Workshop wrote to each participant as the nominations came in with a view to preparing him for the Workshop. Each participant was asked to send to the Director prior to the beginning of the Workshop a brief outline of his or her own research problem. Many of the participants did send in such notes which subsequently formed the basis of discussions during to Workshop sessions.

The Group :

The list of participants consisted of five staff supervisors, three of whom were resident staff and thirty research scholars apart from the Director who was with the group throughout and visiting resource personnel. Four of the research scholars were M.Litt candidates (one from Madurai and three from Osmania); all others were Ph.D candidates in different stages of their research programmes, most of them in the initial stages. Five of the research scholars were women (two from Kerala and three from Madras). Full-time research scholars numbered nine ; the rest were members of the teaching faculties of the Universities themselves or colleges affiliated to them, two of them being Heads of Departments in affiliated Colleges. All possessed M.A. degrees in economics (or the old B.A. (Hons) degree considered equivalent to the M.A.). Three had additional degrees in law, one in commerce, one in statistics, one in philosophy, one in teaching. Two had already acquired the M.Litt degree. Among the research scholars the youngest was 21 years old and the oldest 44. Their field of specialisation also showed considerable variety. Ten participants were dealing with problems of agriculture including land tenure, technological change, credit and agro-industrial relationships. Other topics of research included the study of exports, public sector projects, labour absenteeism, regional

planning, the role of development banks, pricing of the petroleum industry, Centre—State financial relations, unemployment, fiscal policy, long term educational planning, the role of light Industries, the consumption function, the growth theories of Ricardo and Marx and an evaluation of the economic thinking of Ranade and Kale. Thus the thirty participants were scholars working in fifteen distinct areas of study and research. Such variety contributed to the vitality of the group and occasionally led to lack of adequate communication also.

The Workshop Technique :

Members of the Indian academic community are known all over the world for their high propensity to talk and the equally high propensity to listen. Unfortunately, however, those who talk seldom listen and those who listen hardly ever speak. Consequently there is a rather rigid class structure in our academic community built on the implicit premise that the 'professionals' talk but do not have to listen and the 'novices' are to be seen and not heard. One of the intentions of the Workshop was to break this hoary tradition by making the Workshop deliberately participant oriented. Except for a few lectures on statistical methods there were no classroom type of presentations during the entire forty days. Even those few lectures were more of the dialogue type with the participants raising questions and participating in other ways throughout the presentation. Not only was the entire course participant—oriented, the programme itself was completely unstructured with the members of the group themselves deciding week after week what the order of business was to be, within the broad bounderies suggested by the Director. Organising a training course in research methodology on the basis of a well-designed lecture series with peripheral participation of those attending the course would have been a much easier and neater procedure. And the decision to leave the six week programme largely unchartered was taking the very serious risk of inviting academic anarchy. But it was also an equally strong affirmation of faith in the earnestness, resourcefulness and maturity of the participants. There was a second objective in resorting to the Workshop technique. How do research workers come to have a mastery of research methods? They can be told that they must

delineate their field of enquiry, gather relevant material, formulate a hypothesis, test it and arrive at some conclusions. But if there is one area where to learn is to do, it is research. And research methods, rather like the best of jokes, fall flat when they are doled out for their own sake. Research methods must be related to research problems. The participant-oriented workshop technique was a recognition of the fact and an attempt to make research methods relevant to the participants by relating them to their own individual research problems.

The Procedure:

The corporate work of the Workshop was from 8 a,m. to 1 p.m. everyday with a half hour coffee break from 10.30 a.m. to 11 a.m. On Saturdays usually only the first session was held and Sundays were free. During the afternoons the participants were free to do their own work in the College library, or in one of the libraries in the city. The Economics Department of the Madras University loaned about 200 volumes for the use of participants and these volumes were also at their disposal.

During the first week the position papers specially commissioned for the Workshop were taken up for discussion beginning with the paper on 'What is Economic Research' by Mr. S.P. Ahuja, Director of Research, Indian Institute of Public Opinion, Delhi. The other position papers were — 'Identification of Research Problems' by Dr. P. R. Brahmananda, Professor of Economics, University of Bombay; 'Use of National Sample Survey Data' by Dr. P. G. K. Panikar, Head of the Department of Economics, University of Kerala; 'Typology and Research Design in Economic Analysis' by Dr. G. Mathur, Head of the Department of Economics, Osmania University; 'Methodology of Economic Research in Long Time Span' by Dr. V. Shanmugasundarm, Head of the Department of Economics, University of Madras; and 'Methodology of Surveys and Sampling Techniques' by Dr. A. Ganguly, Indian Statistical Institute.

Each position paper was introduced by a group chosen by the members themselves, who presented a brief review of the paper and picked up questions for discussions. One of the remarkable achievements of that week was a paper on 'The Problem of Con-

ceptualisation in Research' which one of the participants Mr. N. D. Nandekar of the Osmania University prepared in place of the commissioned paper which did not arrive. The first week showed that the participants were men and women with alert and critical minds who were able to evaluate the worth of the position papers and enter fully into a discussion of the often abstruse problems of research methods raised in them. Neither were they particularly kind to some of the papers which fell far short of the expected level and which betrayed the fact that some of the senior men in the profession are either too busy to keep up their scholarly pursuits or too restricted in their approach to the subject. During the first week again a common mock problem was placed before the participants and each one was asked to convert it into a research problem. The assignment was evaluated by the senior members of the group and a number of individual assignments were placed before the group for corporate scrutiny. The examination of these assignments was one of the highlights of the first week which showed the participants how a commonplace economic problem can be shaped into a research problem. Each participant also wrote a note about the source of data in his own field of research and the procedure adopted by him to process the data.

The expository lectures on statistical methods came in the second week and were given by Prof. N. S. Iyengar of the Osmania University who was also the first resource person to visit the Workshop. A corporate exercise attempted during the week was critical evaluation of published research papers such as the paper on 'Poverty in India' by Dandekar and Rath. One of the participants assumed the responsibility to introduce the paper and examine it mainly from a methodological point of view. Such exercises in criticism again helped the participants to familiarise themselves with methods of research and to see how they are utilised in a concrete case.

The third, fourth and fifth weeks consisted mainly of presentations of research problems by individual participants. During the third week Prof K. S. Sonachalam was with the group as the resource person. His stay overlapped with that of Dr. O. R. Krishnaswamy, one of the senior participants of the Workshop who could not be with the Workshop throughout the six weeks.

Because of the special interests of both Prof. Sonachalam and Dr. Krishnaswamy in agricultural problems, the problems presented during that period related mainly to agriculture, light industries and industrial structure and pricing. Participants working on agricultural problems had several informal group meeting with Prof. Sonachalam and Dr. Krishnaswamy sometimes going late into the night. Dr. K. N. Raj who was expected in the fourth week had to cancel his programme at the last minute.

During the fifth week Dr. S.K. Bhattacharyya of the Calcutta University and Dr. K. Krishnaswamy of the Institute of Economic Growth, Delhi were with the group. The role of all these resource personnel was to help the research scholars to understand and appreciate the possibilities, difficulties and implications of their research problems and to indicate to them how best the problem could be developed and analysed. The Workshop was very fortunate indeed that the resource personnel understood their role and fitted in perfectly into the General ethos of the Workshop programme.

During the course of the first four weeks the participants were also expected to do an individual assignment—compiling a bibliography, writing a paper or doing a field study. These assignments were to be reported to the group during the final week. Nobody opted for field study. Many of the participants especially those who were in the early stages of their work opted for the compilation of bibliography and most of them completed their work also. Among those who proposed to write papers only four completed the work. The failure to take seriously the individual assignments was one of the main weaknesses of the Workshop, which meant also that the programme for the last week was upset. For one or two days in the final week the programme limped along rather feebly. The mood, unfortunately, was set by two or three participants who for very valid reasons had to leave early, but whose departure put the whole Workshop in a break-away disposition. Towards the end, however, with two lively evaluation sessions the programme warmed up again and the group dispersed after making some valuable suggestions regarding measures for follow up and for improving the quality of economic research in South Indian Universities. The recommendations of

the Workshop in this regard are set forth in annex I. The provisional statement of accounts of the Workshop based on the ICSSR grant is set forth in Annexe II.

The Workshop—An Evaluation

There were many things that threatened the Workshop almost from the beginning, not the least of them being the summer heat during the first two weeks. But never once did the Workshop face a crisis in terms of the programme. It would appear, therefore that the decision to take the risk of leaving the programme of the Workshop to the demands and judgments of the participants did pay off. Some misgivings and apprehensions were expressed in the beginning about the durability of an unstructured course for six weeks and in the final evaluation sessions one participant very strongly expressed his preference in favour of a training course with formal and well ordered lectures. But clearly he was very much in the minority. All others had become convinced about the value of the Workshop technique after their experience of it for forty days. While the insistence on individual performance appeared to be something of an ordeal at first, in the evaluation sessions participant after participant spoke of the great usefulness of such open confrontations and the confidence and maturity they had gained from the process. The practice of a doctoral candidate 'defending' his thesis is not widely prevalent in our country. And so often a thesis is written, submitted, read and approved without there ever being a confrontation of minds. One of the valuable contributions of the Workshop was the opportunity it provided for mutual questioning. There were times when the procedure threatened to turn out to be farcical, but where the sessions were organised with proper preparations they were almost invariably a success. These preparations included the participant preparing a one-page outline of his research design programme, making available the copies of the outline sufficiently early to other participants, and the study of the outline by other participants. Not always were all these preconditions satisfied. But it did not take much time for the participants to discover that with proper preparations and serious intentions, the programme could be immensely beneficial, and that where it was not taken seriously the programme would turn out to be a rather unpleasant way of wasting time.

The Workshop also provided an opportunity for the participants to see a good cross section sample of the essentially time dimensional process of research work. Some of the participants were fresh graduates groping for a research problem; others were in the stage of formulating a hypothesis after some preliminary work; yet others were in the final steps of thesis writing. And of course the group also consisted of people who were engaged in post-doctoral research without some of the inhibiting aspects of the Ph.D research programme. With presentations of various vintages, the participants learned how to identify the problems of each stage of research. This was perhaps the most effective way of generating an awareness of the need for an orderly approach to research work.

During the evaluation session one of the participants mentioned with a sense of humour that as a result of the Workshop he was now in a position to say what was wrong with *somebody else's* research design and procedure! But humour apart, this is a very natural state of affairs. It indicates at once that one has acquired the skills and that one has to develop the kind of maturity to be as critical about one's own work as with those of others. The latter, of course, is a matter of life long training in which some succeed more than others, but the former is a sure indication of the initiation into the art and science of research. And it can be said, without much exaggeration that the Workshop enabled each participant to understand what was deficient and lacking in his neighbour's research work. Nobody suffered from want of criticism and suggestions!

From the methodological point of view the main success of the Workshop was that it led most participants to arrive at the subjective realisation that familiarity with research methods is absolutely necessary for any successful research programme. Among the participants were many for whom research meant simply sustained and hard work for a period of time prescribed by the University, and it is true also that often a Ph.D degree is simply a consolation prize for sincerity and tenacity—if that! Some of the participants who had been working on their Ph.D thesis for over two years, had with them all the data they had collected, all the notes they had gathered and all the 'chapters' they had written—running into hundreds of pages—without so

much as a clue as to what their problem was about. That there is a certain procedure and discipline about research came as a surprise, and at times as a shock to many participants. One can only hope that the shock therapy that the Workshop attempted will have some long-term effects.

Lest all this should convey too rosy a picture about what happened it is necessary also to point out some of the weaknesses and shortcomings of the Workshop. The success of an unstrucured programme of training is positively correlated to the extent and thoroughness of pre-planning. The Summer Workshop, of course, did not have the kind of pre-planning and preparation that was required. One aspect where the inadequacy of pre-palnning showed up was in the uneven distribution of resource personnel over the total span of the Workshop. The original proposal was to have four senior members of the profession stay with the group from the beginning to the end. The laws of supply and demand were simply against this ideal state of affairs. And while the experts that the Workshop managed to get were all top men in the profession their stay turned out to be too brief in terms of the expectations and needs of the participants. Because of inadequate planning, again, the library facilities made available to the participants were far from satisfactory, which, to some extent accounted for the failure of the individual assignment programme. Some of the physical aspects of the Workshop also could have been more properly and satisfactorily handled if some more thought to these issues were given in the brief planning period. But when all is said and done, it is something of a miracle indeed that the Workshop *did* meet, that *all* South Indian Universities sent participants and that they lived and worked together fruitfully for forty days. The credit for it goes to the drive and dynamism of Dr. Malcolm S Adiseshiah, the active support of the Indian Council of Social Science Research, the willing co-operation of the Universities and not least the generous accommodating spirit of the participants who were willing to put a much higher premium to the nourishment of the mind than to the comforts of the body. It was a good Workshop but by no means the best. But often the best is the enemy of the good and one has much to be thankful that the vision of the best did not prevent us from settling for the good.

Economic Research in South Indian Universities - Some Reflections :

There was a time when South Indian Universities were the leaders of research in economics in the country. But that was in the fairly distant past. During the past decade or so it has become a constant chorus of the brains of the North that economics stops on the northern side of the Vindhyas. There is an element of chauvinism in such statements, and yet nobody in the South can deny that the standard of research in South Indian Universities is appallingly low. But why ? One reason is the very legacy of our past. The South Indian tradition in economics is the empiricial tradition, of village studies, for instance, initiated and admirably carried out by Gilbert Slater and his 'school'. But perhaps the intensity of our commitment to this worthy method has prevented us from becoming alive to the rapid progress made in the profession elsewhere in the world and even within our country in terms of theoretical and analytical research and the vast array of sophisticated tools of research. In the light of the progress made in other parts, our research workers appear to be hewers of wood and drawers of water. Even a casual look at the research topics of the participants of the Workshop will reveal how very conventional and worn out the areas of work are. Consequently there is little intellectual excitement about research and research topics—everybody does 'one of these things' enough to satisfy the minimum requirements to be able to add a coveted degree on one's stationery. The situation is so bad that in some Universities research scholars are prevented from having access to previous dissertations for fear that a 'new' thesis may be little more than a reproduction of an old one! We are unable or reluctant to accept the fact that an old era when research meant learning more and more about less and less is gone. It is one of the facts of life in the comtemporary academic world that even to know more about less one has to know more about more. Mr. Ahuja underlined this aspect both in his paper and in his discussion with the group when he said that eighty percent of a research scholar's intellectual investment must be in the common stock of the profession and only twenty per cent in his own speciality. The absence of a common fund of knowledge even of a very elementary level became painfully obvious during the Workshop when most participants, at least in the initial stages had

little to say about anything other than their own narrow field of concern.

There are some identifiable reasons for this sorry state of affairs. The first is the inadequacy of training in theory and in quantitative methods. In most South Indian Universities the theory papers are extremely weak even at the M. A. level and there is an attempt to keep it at that level— an implicit conspiracy of the members of the boards of studies, paper setters and examiners, teachers and students, all of whom are satisfied with a diluted concoction of miscellaneous ingredients which passes under the name of 'theory'. The grudgingly conceded papers in quantitative analysis are no better. As long as this situation continues there is little hope of improving the quality of economic research in the South. Two thirds of the participants in the Workshop did not have *any training whatever* in quantitative methods. The younger. members at least had a compulsory paper in Statistics at the M. A. level.

The second reason for the poverty of research in our Universities is the lack of any training in and the total absence of the need for independent thinking till a person registers for a research degree. Right upto the M. A. we have only the question-and-answer approach to education where neither the teacher who first hands out information nor the student who hands it back later has the responsibility to defend what he says or writes. Copious reproduction from other sources with or without acknowledgements is what is often considered to be good teaching; equally voluminous reproductions from other sources with but marginal comments of a very superficial nature is what is considered to be original research. The members of the Workshop became aware of this short - coming and have asked for some sort of independent work to be made part of the M. A. course at least on an optional basis.

There is another obvious reason for the poor quality of research in the South Indian Universities—the paucity of competent scholars. There are many competent and outstanding South Indian economists who prefer to be in the intellectually stimulating atmosphere of Delhi, Bombay, or the more promising

lands beyond. Few of the South Indian Universities have the critical minimum mass of scholars necessary to attract talent and to sustain lively intellectual work. We have suffered a great deal from this backwash effect. Both as a contributing factor to this and as an inevitable result, faculties of economics in the South have become too in-bred. The vitality of a place like the Delhi School of Economics was the result of its ability to attract scholars from different parts of the country and abroad to work together for fairly long periods of time. Unfortunately, no department of economics in South Indian Universities to day has even the potential to develop into a strong centre of learning and research corresponding to what the Delhi School of Economics was till its disintegration set in a couple of years ago.

These are far-reaching problems for which there are no easy solutions. But all of these get reflected in the pattern and level of research in the region. Research scholars, many of them of potentially excellent quality do not get sufficient guidance from their own Universities. This is not a judgment on anybody's competence or willingness. It is in the very nature of the situation that a small faculty cannot handle a wide variety of research problems and give the necessary guidance. So young scholars, understandably anxious about the degree stick to 'safe' topics and elementary procedures. Or they come up with some issue of current policy significance hoping that thereby they will be able to solve the country's many economic problems. The motive certainly is unquestionable, but the procedure is rather poor. And so we are stuck in the same old rut with our mutual admiration societies, our petty patronages and the unpardonable self deception that we are doing tolerably well.

Living in this fool's paradise we are also jeopardising the prospect of the future generation as well. It is this danger that the Workshop has unearthed, that brilliant minds and ardent souls are not being provided the opportunity to grow and mature. There is a sense in which the Universities are helpless in this matter. A necessary condition for quality research work is a community of scholars, and our Universities are not likely to have such communities in the immediate future. Training in research methods, again, is absolutely necessary for raising the

level of research. But Universities cannot afford to organise training courses for their occasional Ph.D. candidates. It is in this area that Inter-University efforts like the Summer Workshop can perform their legitimate function. The participants of the Workshop have strongly recommended that it should become an annual feature. It is a legitimate and important recommendation. It is a recommendation charged with high stakes because it emanates from a small but decisive group of future South Indian Economists and has reference to those who will succeed them every year as research scholars, on whose advice, policy guidance, research work and out-put, the economic development of the southern half this great land rests.

The recommendation cannot go unheeded. It will not.

ANNEX I

RECOMMENDATIONS OF THE WORKSHOP

1. In order to encourage students to develop the habit of independent academic work the writing of a paper or at least an essay paper in the examination should be included among the optional subjects in the M. A. Course.

2. Some training in the methods of research must be made a pre-condition for registering for the Ph.D. degree or must be included in the Ph.D. programme as such.

3. The limited financial and academic facilities now available for a research scholar to do part of his research work in another university or recognised centres of research must be substantially increased.

4. Regular short-term courses in statistical methods, mathematical economics, econometrics, logical analysis etc. should be conducted every year in different universities and research centres. The programme for such courses for a year should be announced sufficiently early to enable the research scholars to select the courses they require and to prepare for them. The I.C.S.S.R. and other agencies must take the initiative to have such a programme organised.

5. Registration rules for the Ph.D. programme should be made flexible as pertaining to thesis title, selection of guides etc.

RECOMMENDATIONS REGARDING FOLLOW-UP

1. Summer Workshops in Research Methods should become an annual feature till alternative arrangements are made to ensure that all research scholars receive necessary training in research methods.

2. Two such workshops must be organised every year, one for new research scholars, and the other as a follow up course for selected participants of the previous year's programme.

3. The selection of participants to the latter must be based on an evaluation of their research work during the six months immediately following the first.

4. The programme of these workshops must be participant oriented, but may be supplemented, especially in the case of the first, with group discussions on the basis of areas of interest, and lectures and field-work on an optional basis.

5. Some basic books on research methodology should be given to the participants of these courses.

6. The Karnatak University should be requested to conduct one, or both workshops next year.

ANNEX II

PROVISIONAL STATEMENT OF ACCOUNTS OF THE WORKSHOP

ITEMS		ICSSR GRANT	EXPENDITURE
1. Director and Resource Staff honorarium and travel	...	6,700.00	4,251.00
2. Background papers	...	3,000,00	1,800.00
3. Participants :			
(a) Travel	...	7,750.00	3,899.00
(b) Boarding & Lodging	...	8,775.00	8,662.32
4. Publication of Guide	...	3,000.00	3,000.00
5. Printing, Postage, Stationery, typing and secretarial assistance	...	1,500.00	1,744.70
6. 5% over head	...	1,461.00	1,167.85
Total	...	32,186.00	24,524.87

Regd. No. M. 8831

MADRAS INSTITUTE OF DEVELOPMENT STUDIES (MIDS)

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— Documentation and library service in development programmes ;

— Exchange and dialogue at the State, National and International levels on development issues ;

— Publication of papers and research results of the Institute.

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